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**Performance-Based Life Cycle Product Support: A New Look at
Enablers and Barriers**

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Prepared for the Naval Postgraduate School, Monterey, California 93943

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Preface & Acknowledgements

During his internship with the Graduate School of Business & Public Policy in June 2010, U.S. Air Force Academy Cadet Chase Lane surveyed the activities of the Naval Postgraduate School's Acquisition Research Program in its first seven years. The sheer volume of research products—almost 600 published papers (e.g., technical reports, journal articles, theses)—indicates the extent to which the depth and breadth of acquisition research has increased during these years. Over 300 authors contributed to these works, which means that the pool of those who have had significant intellectual engagement with acquisition issues has increased substantially. The broad range of research topics includes acquisition reform, defense industry, fielding, contracting, interoperability, organizational behavior, risk management, cost estimating, and many others. Approaches range from conceptual and exploratory studies to develop propositions about various aspects of acquisition, to applied and statistical analyses to test specific hypotheses. Methodologies include case studies, modeling, surveys, and experiments. On the whole, such findings make us both grateful for the ARP's progress to date, and hopeful that this progress in research will lead to substantive improvements in the DoD's acquisition outcomes.

As pragmatists, we of course recognize that such change can only occur to the extent that the potential knowledge wrapped up in these products is put to use and tested to determine its value. We take seriously the pernicious effects of the so-called “theory–practice” gap, which would separate the acquisition scholar from the acquisition practitioner, and relegate the scholar's work to mere academic “shelfware.” Some design features of our program that we believe help avoid these effects include the following: connecting researchers with practitioners on specific projects; requiring researchers to brief sponsors on project findings as a condition of funding award; “pushing” potentially high-impact research reports (e.g., via overnight shipping) to selected practitioners and policy-makers; and most notably, sponsoring this symposium, which we craft intentionally as an opportunity for fruitful, lasting connections between scholars and practitioners.

A former Defense Acquisition Executive, responding to a comment that academic research was not generally useful in acquisition practice, opined, “That's not their [the academics'] problem—it's ours [the practitioners']. They can only perform research; it's up to us to use it.” While we certainly agree with this sentiment, we also recognize that any research, however theoretical, must point to some termination in action; academics have a responsibility to make their work intelligible to practitioners. Thus we continue to seek projects that both comport with solid standards of scholarship, and address relevant acquisition issues. These years of experience have shown us the difficulty in attempting to balance these two objectives, but we are convinced that the attempt is absolutely essential if any real improvement is to be realized.

We gratefully acknowledge the ongoing support and leadership of our sponsors, whose foresight and vision have assured the continuing success of the Acquisition Research Program:

- Office of the Under Secretary of Defense (Acquisition, Technology & Logistics)
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- Program Executive Officer Integrated Warfare Systems
- Office of the Assistant Secretary of the Air Force (Acquisition)
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James B. Greene, Jr.
Rear Admiral, U.S. Navy (Ret.)

Keith F. Snider, PhD
Associate Professor



Panel 8 – Issues in Services Contracting

Wednesday, May 11, 2011	
1:45 p.m. – 3:15 p.m.	<p>Chair: Rear Admiral David F. Baucom, USN, Deputy Assistant Secretary of the Navy, Acquisition & Logistics Management</p> <p><i>Determinants of Service Contract Outcomes</i></p> <p>Tim Hawkins and Gregory Hildebrandt, NPS, and William Muir, USAF, 771st Enterprise Sourcing Squadron</p> <p><i>An Evaluation of IDIQ Contracts for Services</i></p> <p>William Lucyshyn, Jacques Gansler, and Amelia Corl, University of Maryland</p> <p><i>Performance-Based Life Cycle Product Support: A New Look at Enablers and Barriers</i></p> <p>Tom Edison and Andre Murphy, DAU</p>

Rear Admiral David F. Baucom—Rear Admiral Baucom became the deputy assistant secretary of the Navy (Acquisition and Logistics Management) in September 2009. He provides policy and oversight to all Navy and Marine Corps contracting and acquisition logistics efforts and serves as the Department of Navy's competition advocate and standardization executive. He is responsible for facilitating and improving the acquisition system by developing innovative processes and tools and proactively acquiring, interpreting, and sharing business intelligence and best practices.

Prior to assuming his current position, he served as assistant deputy chief of staff for Fleet Readiness and Training/Fleet supply officer at U.S. Fleet Forces Command. He had previously served as commanding officer, Fleet and Industrial Supply Center, Norfolk. A native of Blythewood, S.C., Baucom graduated with a Bachelor of Science degree in Industrial Management from Auburn University, where he received his commission through the Naval ROTC program in 1981. He also fulfilled all requisites for a second Bachelor of Science degree in Personnel Management And Industrial Relations from Auburn. He earned a Master of Science degree in Acquisition and Contract Management from the Naval Postgraduate School and a second Master of Science degree in National Resource Strategy from the Industrial College of the Armed Forces at the National Defense University.

He is a graduate of the Executive Program at the Darden Graduate School of Business Administration at the University of Virginia and a graduate of the Executive Program in Logistics and Technology at the Kenan-Flagler Business School at the University of North Carolina at Chapel Hill. He is a certified Level III acquisition professional in the contracting career field; a certified professional contracts manager in the National Contract Management Association; and a graduate of the Senior Acquisition Course at the Defense Acquisition University. He is a Lean Six Sigma Executive Green Belt, a qualified naval aviation supply officer, and a designated joint specialty officer.

Baucom served in a variety of key leadership positions afloat and ashore. At sea, he served as supply officer, USS *Edward McDonnell* (FF 1043); stock control officer, USS *Theodore Roosevelt* (CVN 71); and as the first supply officer in USS *Ronald Reagan* (CVN 76). Joint duty assignments include duty as the deputy assistant chief of staff for logistics at the Headquarters, Supreme Allied Command Transformation and in the Joint Staff, the Pentagon. Additionally, he served at the Fleet and Industrial Supply Center, Yokosuka, Japan; in the Office of Supply Corps Personnel; and in the Enlisted Plans Division at the Bureau of Naval Personnel. He served as the executive assistant to the deputy commander for Logistics in the Naval Supply Systems Command; in the Space and Naval Warfare Systems Command; and as a White House military aide to President and Mrs. Ronald Reagan.



Performance-Based Life Cycle Product Support: A New Look at Enablers and Barriers

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Andre Murphy—Professor, Life Cycle Logistics (LCL) and Systems Planning, Research Development, and Engineering (SPRDE), Defense Acquisition University, West Region, San Diego, CA. Dr. Murphy holds a Master of Science in Administration from Central Michigan University and a doctorate in Leadership Studies and Organizational Development (Operation Research focused) from the University of San Diego. He has served seven years as a major defense acquisition program (MDAP) weapon system life cycle logistics and human system integration consultant to program directors, product group managers, and directors of contracting for Program Executive Offices and systems commands. [andre.murphy@dau.mil]

Abstract

The results of this study were obtained via a survey deployed to the DoD and contractor personnel working primarily in program management and logistics management by Defense Acquisition University. The study highlighted the impact of 15 factors on implementation of Performance-based Life Cycle Product Support (PBL). The study contrasted 2011 results to a previous 2005 study on PBL barriers and enablers. The results of this study have applications to successful implementation of PBL throughout the DoD and the commercial industrial workplace.

Significant information was obtained on 15 factors regarding effects on PBL implementation. Ten of the evaluated factors were determined to be enablers; five were determined to be barriers.

The research provided the following results:

1. The top two most significant enabling factors for PBL were maintaining Warfighters' Perspective and Strategic Alliances/Partnering in the 2011 study;
2. The top two barriers to PBL were Cultural Paradigms and Technical Data in the 2011 study;
3. Warfighters' Perspective (2011) replaced Performance Metrics from the 2005 study as the most significant enabler;
4. Cultural Paradigms (2011) replaced Funding from the 2005 study as the most significant barrier; and
5. Two barriers from the 2005 study were determined to be enablers in the 2011 study (Training and Awards/Incentives).

Background

Efficient and effective product support strategy development and implementation is not simple. More and more focus has been placed on how to deliver cost wise and effective support for our warfighting capability. During the last few decades there have been several



different types of DoD logistics initiatives introduced in order to improve supply chain performance, management processes, and increase materiel readiness. Among the aforementioned initiatives is Performance-based Life Cycle Product Support (PBL), which remains a topic of currency and has continued to evolve. PBL fundamentally reshapes how we think about product support strategy development and implementation.

Fast forward, since the beginning of the 21st century, the Office of the Secretary of Defense (OSD) has been steadfast in directing that PBL be considered as the preferred outcome-based product support solution. More recently, with Congress passing the National Defense Authorization Act (NDAA) for FY 2010, Section 805 directs the use of appropriate product support strategies to assure attainment of required readiness outcomes, such as PBL. On the one hand, many program managers and logisticians understand that PBL solutions can offer the best overall performance outcome based product support strategy for long-term sustainment of systems, subsystems, and components. On the other hand, some remain pessimistic about the return on investment (ROI) that PBL can provide. In an environment where Better Buying Power—Obtaining Greater Efficiency and Productivity in Defense Spending is not only prescribed but prudent, there is a growing need to better understand, identify, and implement product support models that are performance outcome based.

This paper will review some of the issues surrounding PBL implementation in the DoD. Specifically, it will discuss some studies by Defense Acquisition University (DAU) on factors affecting barriers and enablers to DoD PBL implementation.

Introduction

PBL's translation or acronym meaning has changed. It now translates into Performance-based Life Cycle Product Support vice its previous translation as just Performance-based Logistics—but has PBL really changed? The objective of this name change for PBL was to broaden the context of how, why, and when PBL would be implemented. The OSD wanted PBL to take on a broader role in ensuring that it became a more significant enabler to greater product support capability throughout the DoD. They no longer wanted PBL to be thought of as being only outcome focused on the end product from just the perspective of supporting the logistics support elements. PBL needs to be considered throughout the entire life cycle and help to forge a more effective product support strategy throughout the product's entire life—from “must have it” (requirements) to “rust has it” (disposal).

But changing PBL and how it is implemented obviously takes more than a name change. Has PBL really changed over the years since it was embraced in earnest in the late 1990s? This research project's objective was to help gather feedback from PBL implementers on whether things have changed for PBL. Specifically, has the PBL environment changed—have the barriers and/or enablers been transformed for PBL so it can be more successfully implemented throughout the DoD?

Much has been written (Canaday, 2010; DeVries, 2005; Fowler, 2009, 2010; Geary, Koster, Randall, & Haynie, 2010; Kobren, 2009; Miller, 2008; Omings, 2010), spoken, and taught regarding PBL—not only about its advantages, but also about what prevents it from being fully embraced and effectively implemented by all the Services. See the Literature Review section for more details on what has been written about PBL. This study highlights some of the data that were obtained to more effectively understand what conditions and perceptions exist in implementing PBL throughout the DoD.



Have the perceptions of PBL being too expensive, requiring greater funding, or being too complicated to implement in terms of developing proper contractual incentives/awards or partnering agreements changed? Have the Services' viewpoints of PBL changed? Have some of the barriers and enablers to PBL's effective and efficient implementation changed over the last 5–10 years? What impact has PBL had on DoD weapon system programs? Are programs using the Business Case Analysis to assist them in analyzing PBL decisions? These were some of the questions this study wanted to answer.

This research analyzed the current perceptions of PBL through the eyes of approximately 300 military, civilian, government, and contractor personnel working primarily in program management and logistics. The respondents were asked to rate 15 factors as to whether they believed a factor was a barrier or an enabler to PBL implementation. They also rated how significantly they believed this factor impacted PBL implementation in their program on a scale from 1 (minimal) to 4 (very significant). They were asked other related questions to determine if they had accomplished a Business Case Analysis on their program and what the overall impact was on their program's cost, schedule, and performance from implementing PBL.

Literature Review

This section begins with an overview of literature associated with Performance-Based Life Cycle Product Support and concludes with a synthesis of the authors' perspectives on performance outcome based product support implementation.

Since PBL is becoming a growing practice within industry and the DoD, the literature discussed herein will leverage both bodies of knowledge. Before the discussion begins, we should level the playing field with a common understanding of what PBL is. As Kobren (2009) asserts, PBL is about performance. It is about readiness. It is also about enabling mission accomplishment and ensuring the warfighter has weapon systems that are available, reliable, and supportable when and where required. PBL is part of a long tradition of contracting for performance. Since its inception, PBL has continued to evolve. The shift toward Integrated Logistics Support attempted to wrap together the distinct logistics elements into a coordinated approach, but there was still the disjointed acquisition versus sustainment–support issue, and the lack of a linkage between supportability measures and warfighter needs (DeVries, 2005). Fowler (2009), then Assistant Deputy Under Secretary of Defense for Materiel Readiness, believes the time is coming to rebrand the sustainment approach. The rebranding effort should include an emphasis on re-integrating complete life cycle sustainment into programs.

Clearly, product support, while primarily a logistics and sustainment function, is not actually synonymous with the fundamental aspect of logistics. To that point, product support encompasses materiel management, distribution, technical data management, maintenance, training, cataloging, configuration management, engineering support, repair parts management, failure reporting and analysis, and reliability growth (DoD, 2009). To further this point, Canady (2010) talks about how PBL remains the preferred method for weapon systems sustainment. However, defense officials are scrutinizing PBL strategies, such as those on the C-17, pressing for lower costs, better proof of savings, and more government control of long-term sustainment options.

Geary et al. (2010) inform us that effective product support requires contributions from both the public and private sectors. A significant challenge over the course of the next decade, particularly in today's acquisition environment of declining financial resources combined with projects deficits and undiminished operational demands, is creating a more



effective, unified, and fiscally prudent industrial integration strategy for product support. They also highlight some of the real DoD innovators and enablers in deploying PBL effectively and why they were successful. Some of the highlighted key enablers to PBL's success were the following: integrated partnerships, incentive strategies, a culture of innovative teams, shared visions on objectives/metrics/incentives, and shared common grounds on win-win scenarios between industry and government.

In government, PBL has garnered undesirable outcomes. A few organizations have implemented support strategies under the guise of a performance outcome based strategy only to discover the product support was a hybrid version of a transactional arrangement. DoDD 5000.01 (USD[AT&L], 2007) directs program managers to develop and implement performance outcome based logistics strategies that optimize total system availability while minimizing cost and the logistics footprint. But, more than we would like to think, organizations proceed at their own peril by initially not conducting a business case analysis to determine their return on investment (ROI) associated with their product support decision. Fortunately, there are true successful ventures that evidence those attributes and objectives sought with PBL implementation (Beggs, Seymour, & Ertel, 2005).

Miller (2008) identifies an ingredient required for a successful PBL undertaking, stated plainly: get on with the work of sourcing the best possible product support results for the warfighter, given statutes and regulations governing your options. Find the most cost-effective means of supporting warfighters. He further states that the research is clear, that properly done, PBL can be an important part of the solution. He also highlights several barriers and enablers that affect PBL implementation—similar to those studied in this research. He identifies funding, regulations, BCAs, no burning platforms, and several other misperceptions of PBL driven by a misunderstanding or lack of experience working with PBL.

Fowler (2010) suggests that PBL will only succeed when driven from the topmost levels in the program or organization. One can summarize that only top-level managers have the breadth of perspective and authority needed to see the entire process from start to finish. An effective proponent of PBL must be part visionary, part communicator, and part leg breaker. Program managers are charged with ensuring the development and implementation of performance outcome based strategies that strive for a more cost effective weapon system support approach and a balanced use of public private partnerships. Program managers and logisticians must be open to contrasting product support strategies in order to experience those benefits that PBL can afford a weapon system.

Omings (2010) offers that, in certain circles, PBL has been viewed as a business fad and is derided in much the same fashion as Total Quality Management and Lean Six Sigma when those concepts were first espoused—misconceptions on their true value. He highlights that it is true that these methods are not a panacea, but time has shown that when applied under the right circumstances, they can provide powerful results.

Rounding out the review of the literature on PBL are posits by the former Deputy Under Secretary of Defense for Materiel Readiness, Randy Fowler. In his 2010 work, *Future of Product Support*, mentioned previously, Fowler describes that among critics there remains a strong consensus that an outcome based, performance-oriented product support strategy is a worthy objective. As much as any other organizational construct to date, Fowler touches the situation of Defense leadership. On the one hand, transforming product support will require not only strong leadership in the DoD, but also an open-minded, reform-driven DoD-congressional partnership and a collaborative DoD-industry relationship to



realize the PBL's objectives. The national security and economic environments dictate tough-minded acquisition reform and logistics transformation. On the other hand, the challenges of affordability constraints; the need to upgrade systems, processes and infrastructure; and a continuing, persistent operations tempo prescribe a clear need for DoD implementation of an integrated plan to address product support across the defense enterprise—like PBL.

One final point about Fowler's discussion on the future of product support should be noted: Fowler, like Kobren, and Geary et al., understand the role of a product support strategy such as PBL where it is crucial to our national interest to ensure that product support achieves a level of performance equal to its importance.

Customer or warfighter requirements, not internal values, should guide the product support manager's performance or decisions. They must replace old ways of thinking with new ideals and expectations associated with letting the old paradigms go. These include replacing perfectionist ways of thinking with experimental thinking, and replacing getting-it-just-right credos with making-it-better credos.

A recurring theme among authors is that the positive preconditions for PBL success are the following: senior management and sponsorship, realistic requirements and expectations, empowered and collaborative PSI (Product Support Integrators), a strategic context for efficiency growth, a shared vision, sound supply chain management practices, and appropriate people participating full-time with a sufficient budget. Some also indentify negative preconditions related to PBL as the following: the wrong sponsor (leader for the job), a cost-cutting focus, a narrow technical focus, and "do it to me" attitudes. Some authors assert, in order to turn around negative conditions, that we must educate the workforce on PBL, and do something small first.

Objectives

It was explained to potential respondents in the electronic survey that this was a research project sponsored by the Defense Acquisition University (DAU) with an objective to gather data on a vital DoD question—has the PBL implementation landscape changed since a previously-conducted 2005 DAU research study? The study examined several factors relating to PBL implementation. The study's intent was to compare and contrast cultural, structural, and process barriers and enablers to effective PBL implementation within the DoD that were identified in the 2005 study. The research highlighted what had changed and made recommendations as to what could help facilitate more effective PBL implementation on new and legacy programs. Another objective of the study was to obtain information for senior DoD leadership on some areas or factors that could be enhanced to help reduce identified barriers. Also it was to help focus on those areas or factors that would enable more effective PBL implementation.

The study's primary focus was to provide an update to a previous 2005 study by Dr. Hank DeVries (2005) that the DAU used to illustrate the barriers and enablers to effective PBL implementation in several DoD programs at various life cycle stages. It was believed that several conditions had changed in the DoD in implementing PBL since the 2005 study by Dr. DeVries. The 2011 study was to interpret these changes in relation to what had prompted their occurrence. The DeVries study and resulting information came from 26 DoD programs surveyed to rate seven pre-identified barriers and seven pre-identified enablers. The seven barriers and enablers were identified as part of the literature survey which reviewed numerous articles and briefings regarding program office experience with implementing PBL.



The pre-identified *Barriers to PBL Implementation* on the 2005 survey were as follows:

1. Funding restrictions/inflexibility (e.g., Working Capital Fund, pots of \$, limited PM control over O&M);
2. Statutory/regulatory requirements (e.g., Title 10 Core, service policies);
3. Old paradigms/culture (e.g., organic versus CLS, parts management versus performance management, minimize contractors on the battlefield);
4. Existing infrastructure/bureaucracy (e.g., PM office structure, stove piping, short PM tours);
5. Tech data (TD) rights;
6. Lack of PBL awareness/training; and
7. Inability to incentivize organic providers.

The pre-identified *Enablers to PBL Implementation* on the 2005 study were as follows:

1. Supply Chain Management (SCM) (end to end customer support, enterprise integration);
2. Strategic alliances/partnerships (e.g., depot partnering, joint ventures);
3. Performance-based (PB) Contracting (e.g., incentivizing performance);
4. Performance metrics;
5. Total Life Cycle Support Management (TLCSM);
6. Adoption of COTS (commercial off the shelf)/best commercial practices; and
7. Reduction in Total Ownership Cost (RTOC).

Dr. DeVries' survey factors were rated on a Likert scale from 1 (Low) to 5 (High) based on their positive or negative influence in implementing PBL on the survey respondents' program. The factors were placed in a category of either being a barrier (seven pre-identified) or an enabler (seven pre-identified) prior to obtaining program feedback on what impact these factors had on PBL implementation. In the current study (2011) the respondents were provided the option to rate a neutrally or unbiased (no predisposition to being an enabler or barrier) worded factor as either a barrier or an enabler. The researchers believed this would provide more meaningful information on the respondents' perceptions of the factor and its effect on implementing PBL.

Some of the significant results from Dr. DeVries' study (2005) regarding the seven pre-identified enablers are as follows:

1. The most frequent enabler that appeared to influence success (in PBL implementation) was Performance Metrics (highest rated enabler). Performance-based Contracting, Total Life Cycle System Management (TLCSM), and COTS/Best Commercial Practices were rated the next highest (same ratings/rankings) in terms of influencing PBL success.
2. Those enablers influencing fewer programs were Supply Chain Management (SCM) and RTOC (Reduction in Total Operating Costs; DeVries, 2005).
3. Note. Not mentioned in the study's text was Partnership, which was rated above both SCM and RTOC in the study but below Performance based Contracting, TLCSM, and COTS Practices (these were all rated the same).



Figure 1 highlights the results from the pre-identified enablers from the 2005 study (DeVries, 2005).

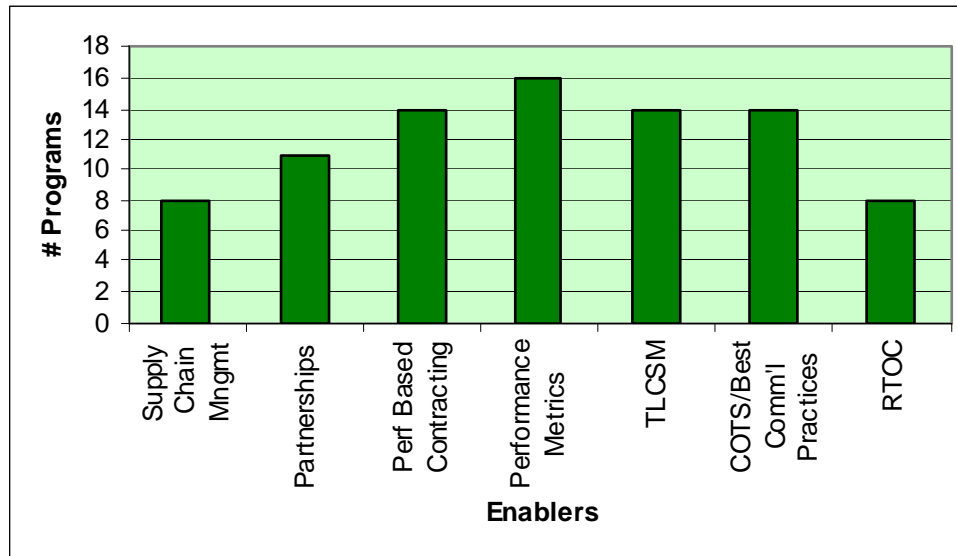


Figure 1. Enablers Rankings, 2005

The following is a summary of the results from Dr. DeVries' study regarding the pre-identified barriers:

1. Funding seems to be the most frequently encountered barrier followed by Statutory/Regulatory, Culture, and Lack of PBL Training.
2. Least encountered barrier was Lack of Organic Depot Incentives, which may be partly due to the use of commercial depots by some of the programs surveyed (DeVries, 2005).
3. Note. Not mentioned in the study's text were two additional barriers identified in the survey to be rated by the respondents: Infrastructure and Data Rights. These two were rated more serious (higher) than Lack of Depot Incentives but lower than the higher rated barriers of Statutory/Regulatory, Culture, and Lack of PBL Training (these were all rated the same).

Figure 2 is a chart that highlights the results from the pre-identified barriers from the 2005 study. (DeVries, 2005).

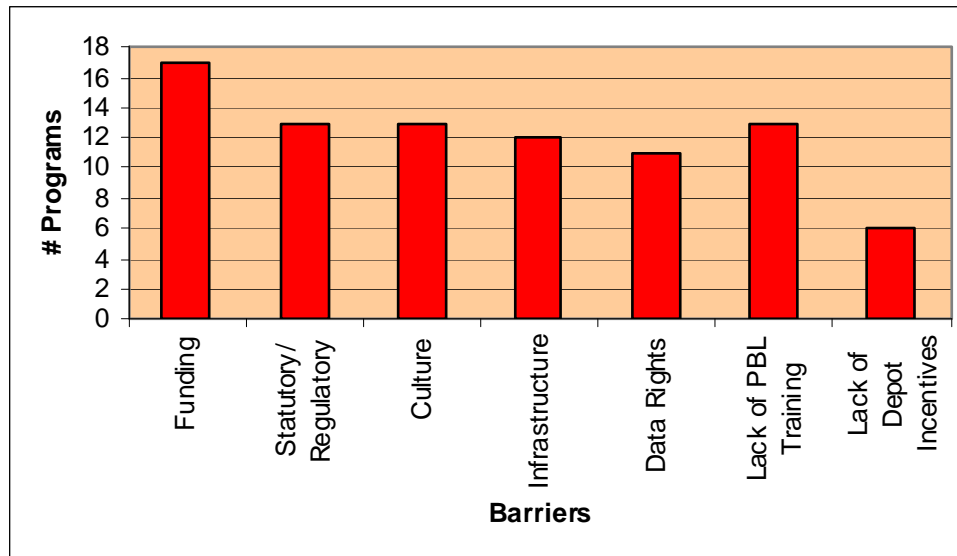


Figure 2. Barriers From 2005 Study

Approach

The approach to gathering the data for this study was to deploy a survey electronically to primarily senior DoD and contractor personnel in early 2011 by the Defense Acquisition University. This research study highlights the perceptions of approximately 300 personnel working in the DoD on the impact of 15 factors on the implementation of Performance-based Life Cycle Product Support (PBL)—whether they were a barrier or enabler and the relative impact of these factors on PBL implementation. The study also contrasts the 2011 results to a previous study on PBL barriers and enablers conducted in 2005. The results of this study have applications to the successful implementation of PBL throughout the DoD and in the commercial industrial workplace.

Various techniques were used to deploy the survey to as wide an audience of the DoD and contractor personnel as possible. The goal was to have respondents complete the survey who had meaningful working experience in implementing PBL. Here is the introduction to the survey:

This survey is to gather information on how barriers and enablers affect the implementation of PBL in DoD. The information gathered in this questionnaire will be protected. Only aggregate information will be discussed.

You may not be aware of all the specifics of these considerations and/or implementation but provide the best answer you can on those items related to barriers and enablers to implementation. Please limit your responses to a specific PBL program effort even though you may have been involved with several. (PBL Implementation Survey, 2011)

The first eight questions of the survey gathered demographic data on the respondents, information about their program (new acquisition program, legacy program, and if they accomplished their PBL at the system, subsystem, or component level). Question 6 asked them if they had accomplished a Business Case Analysis in their

program. Question 14 asked what effect PBL implementation had on the respondents' program.

Question 9 was the heart of the survey and gathered the respondent's perceptions on 15 factors and their impact on their decisions to consider and/or implement PBL in their program. They were instructed to first determine if the factor was a barrier or enabler. They were instructed to rate each factor from either negative (a barrier) 1 (minimal) to -4 (very significant), or to positive (an enabler) 1 to 4 corresponding to how much influence or impact the item had on PBL implementation in their program. They could indicate that the factor had no impact by rating it a zero (0). They could also select N/A if they perceived that the factor was not applicable to their program. No impact and N/A ratings did not affect the factors overall rating scores—they were given a value of zero.

Barriers were identified in the survey as factors such as processes or procedures that inhibit or hinder the effective implementation of PBL. The respondents were instructed that the higher the negative value that they rated an item, the greater the negative impact on their program. Enablers were identified as factors that facilitate or enhance the effective implementation of PBL. The respondents were instructed that the higher the positive value that they rated an item, the greater the positive impact on their program.

The following are the factors that were rated on the survey. The examples after the factor were provided to illustrate greater clarity to the factor itself. As stated earlier, the respondents were provided the option to rate a neutrally or unbiased (no predisposition to being an enabler or barrier) worded factor as either a barrier or an enabler. The researcher believed that by not placing the factors in a category as either a barrier or enabler would provide more meaningful information of the respondents' perceptions of the factor and its effect on implementing PBL.

1. **Funding:** Working capital fund, colors of \$, expiring \$;
2. **Statutory-regulatory requirements:** Title 10, Core, DoDI 5000.02, service policies;
3. **Cultural Paradigms:** Organic versus Contractor Logistics Support (CLS), parts management versus performance management;
4. **Existing Infrastructure or Organization:** Management, oversight/review structures/processes;
5. **Technical Data (TD) Rights:** Ownership of TDP, access to technical data;
6. **PBL Awareness/Training:** Formal DAU training, in-house/OJT, personnel skills;
7. **Incentives/Awards:** Award/incentive fees, administration of innovative contracts/agreements;
8. **Supply Chain Management (SCM):** End to end customer support, enterprise integration;
9. **Strategic Alliances/Partnerships:** Depot partnering, joint ventures;
10. **Performance-based (PB) Contracting:** Incentive/award fees, innovative contracts;
11. **Performance Metrics:** Information systems, variations, trends;



12. **Total Life Cycle Support Management (TLCSM):** PM's TLC product support responsibility;
13. **Adoption of Commercial off the Shelf (COTS):** Commercial practices/procedures, products, subsystems;
14. **Total Ownership Cost (TOC):** Cost accounting, reporting, tracking; and
15. **Warfighters' Perspectives:** Readiness, affordability, combat requirements.

The first fourteen factors listed above are similar in text and meaning to those factors studied in the 2005 report (DeVries, 2005). This was intentional by the researchers to capture and analyze the differences and develop a comparison between the two sets of factors to determine the changes in environment or conditions that had occurred in PBL implementation between the two PBL studies by providing similar factors to evaluate. The researchers wanted to determine the changes in the respondents' attitude or perceptions to PBL between 2005 and 2011. The Warfighters' Perspective is the only different/additional factor added to the 2011 study from the 2005 study.

The respondents were asked to provide additional comments on any barriers or enablers that were rated very significant (the highest rating). In Question 14, the respondents were asked to select what effect PBL had on the effectiveness of the system platform they were working on in meeting program mission requirements while attaining or exceeding cost, schedule, or performance objectives. A space was provided at the end of the survey if they wanted to make any other comments or recommendations. It was discovered after the survey had been deployed (about a week) that the comment sections were limited to 225 words. An updated survey was deployed that highlighted this weakness in the survey and respondents were encouraged if they had more comments that would not fit in the space provided to send an e-mail to the researchers. Several respondents did this and added valuable thoughts regarding the challenges in implementing PBL.

A link to the electronic survey was provided via direct e-mails to approximately 150 subject matter experts in PBL. A link was provided in a blog that was written by a senior DAU logistics faculty member. Additionally, a DAU data base that contained over 6,000 graduates of six different DAU logistics classes also provided e-mail addresses for potential respondents. The survey was deployed to all these DAU students. This approach was probably the most risky in terms of not effectively capturing the experienced PBL personnel the survey was seeking.

Results

The information obtained from the demographic questions (Questions 1–8) and the program's impact (Question 14) is summarized below:

Question 1: What is your function in the program?

Of the 329 respondents that answered this question, 216 (66%) answered Logistics. Sixty-two (19%) answered Program Management. The remaining responses were single digit answers except for the 20 (6%) that answered Other. Logisticians and program manager were the target audience for this survey. Generally, the right personnel had answered the survey.



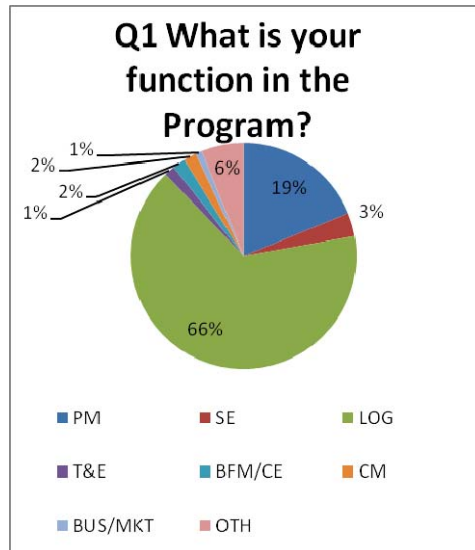


Figure 4. Function in Program

Question 2: How long have you been in the program?

One hundred (30%) of the respondents answered that they had been in the program 1–2 years, while 103 (30%) indicated they had been in the program 3–5 years. The short number of years on programs would be expected since the DoD rotates its personnel into and out of programs on a routine basis. Ninety-eight (30%) had been in the program over 6 years. Twenty-nine (10%) had been in the program more than 15 years.

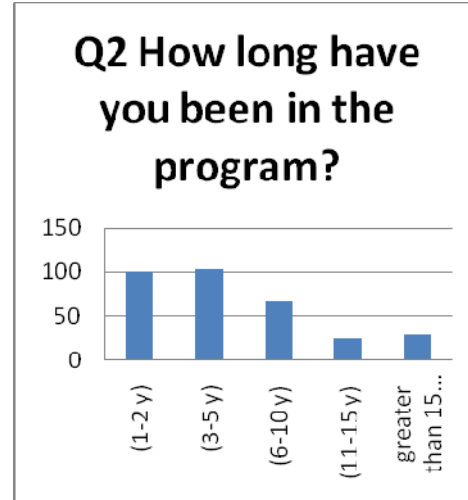


Figure 5. Years in Program

Question 3: How long is your total work experience?

Of the 323 respondents to this question, 216 (67%) responded greater than 15 years. This highlighted the lengthy work experience of the respondents.

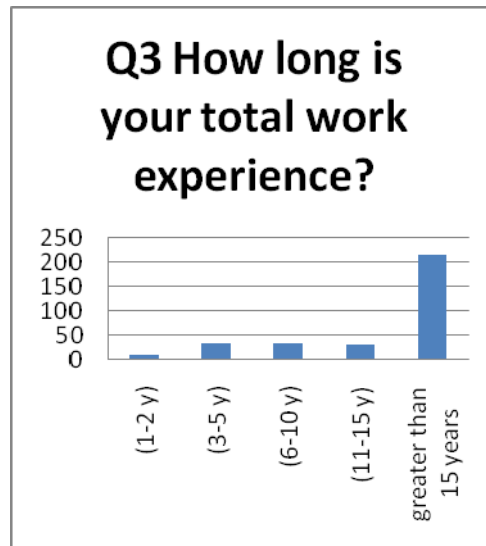


Figure 6. Work Experience

Question 4: Describe your background.

Of the 329 who responded to this question, it was almost evenly distributed between the Air Force, the Navy, and the Army (73, 70, and 79, respectively). There were only eight Marines who responded. This is a nice spread for the three primary Services. Of the total, 262 (80%) were government and 67 (20%) were contractors. It is hoped that additional DoD contractors will respond to the survey while it is kept open for the next three months. The results from these additional respondents will be published in another research journal article.

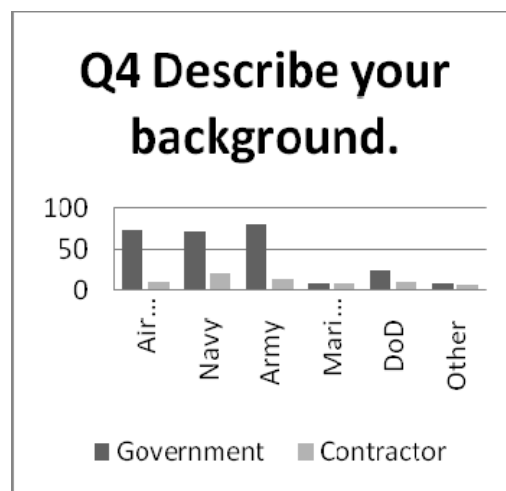


Figure 7. Background

Question 5: Implemented or considered PBL?

All the respondents were initially asked to answer this question and if they answered “no,” they were not provided any additional questions and were asked to comment on their thoughts regarding PBL. This meant that all the respondents to the following (and previous questions) had implemented PBL.

Question 6: Did your program accomplish a Business Case Analysis?

Of the 296 respondents, 204 (70%) answered positively, 46 (15%) responded negatively, and 46 (15%) responded they did not know. There is some concern that only 85% knew if they had accomplished a BCA. It is mandatory for ACAT I and II problems to accomplish a BCA on their product support strategies. If all of the “did not knows” had answered positively in the survey, the number would still be only 85%. It is the 15% that we are concerned with. However, they could have been on ACAT III or higher programs—or they could have been on a legacy program that had already accomplished their BCA. We did not collect this data on the ACAT level of the program the respondents worked on. For future studies this would be good information to collect.

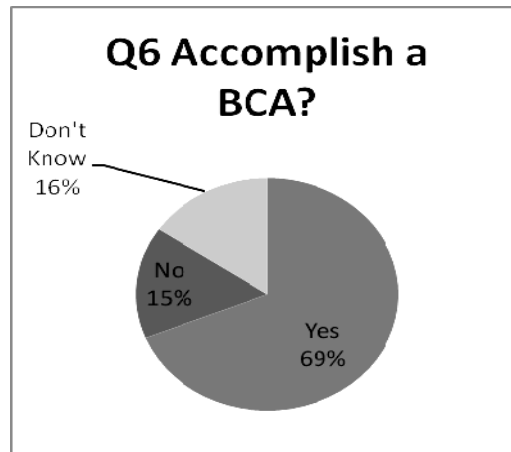


Figure 8. BCA Accomplished

Question 7: What is the stage and scope of PBL implementation either being considered or occurring in your program?

Of the 294 respondents to this question, 126 (43%) responded that they were working on a new acquisition program, and 168 (57%) were working on legacy programs—a fairly equal split. The majority, 155 (53%), were implementing PBL at the system level, 58 (20%) at the subsystem level, and 81 (27%) at the component level. There were 86 (30%) that were implementing PBL on a new acquisition program at the system level, while 69 (24%) were implementing PBL on a legacy system at the system level. See Table 1 and Figure 9 for additional information on this question.

Table 1. Stage and Scope

Q7		
What is the stage and scope of PBL implementation either being considered or occurring in your program?		
	New Acquisition Program	Legacy Sustainment Program
System Level	86	69
Subsystem Level	22	36
Component Level	18	63
	126	168

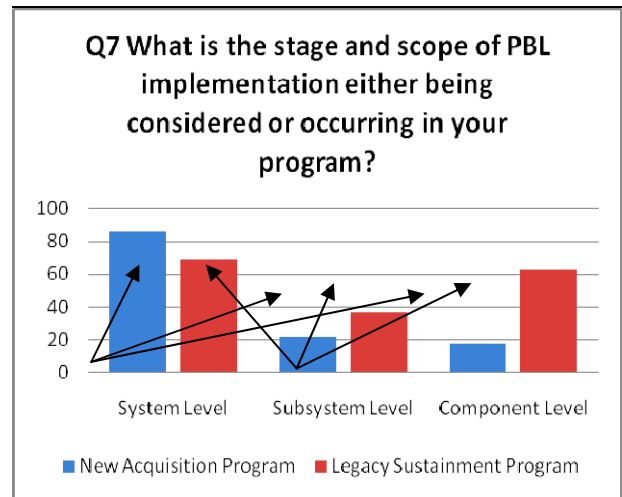


Figure 9. Stage and Scope

Question 8: Select from the following options that best describes who “owns” or budgets for your program.

Of the 295 respondents, 83 (28%) Army, 82 (28%) Navy, 70 (24%) Air Force, and 32 (11%) Joint responded. The respondents were fairly evenly split among the top three Services. The rest were distributed to the Marines with 16 (5%) and 12 (4%) Other.

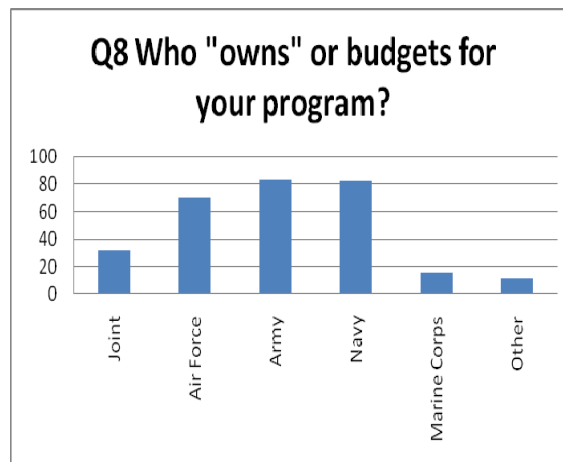


Figure 10. Who Budgets for Program?

Question 14: Select what effect the implementation of PBL had on your program.

Of the 165 respondents, an equal (44 or 27%) number responded to this question for the impact being significant or very significant. It was interesting that 26 (16%) answered that there was no impact from PBL implementation on their program’s cost, schedule, or performance objectives.

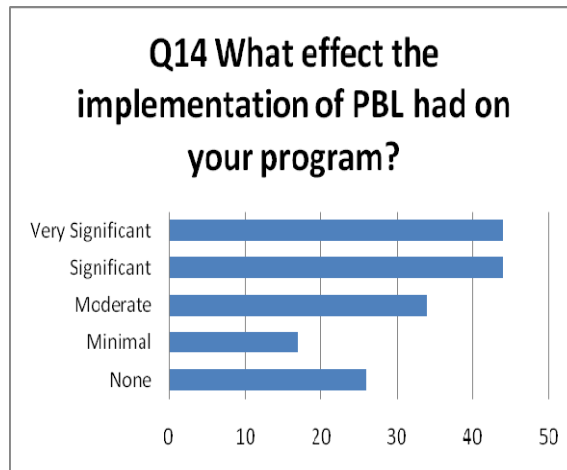


Figure 11. Impact on Program

The information obtained from the most important question, the Factor question (# 9), is summarized next.

Question 9: Evaluate the following factors as to their impact on your decisions to consider and/or implement PBL in your program.

The number of responses in evaluating each of the 15 factors averaged 215 respondents. Significant information was obtained regarding these 15 factors as to their effects on PBL implementation—the main objective of the survey. Ten of the factors were determined by the respondents to be enablers to implementation while five were determined to be barriers. Warfighters' Perspective had the highest rated score. Five factors (Alliances/Partnering, Supply Chain Management, Performance Metrics, Total Life Cycle System Management (TLCSM), and Performance--based (PB) Contracting) were the next in the positive rankings (Enablers) and were similar in rating score (lumped together as a “set” from 169 to 136—see Figure 12). The scores of these five enablers in this set were so similar that little can be interpreted based on their specific ranking score. Another set of four factors in positive ranking (enablers) were lumped together also with scores from 85 to 69. The scores of the four enablers in this set were also so similar that little can be interpreted based on their specific ranking score, other than they are significantly less in magnitude than the previous enabler set.

The formula or method used to determine the factors' specific rating score and whether a factor was a barrier (negative rating score) or an enabler (positive rating score) was to multiple the ranking (either positive or negative 1, 2, 3, or 4 based on the respondent's selection on the survey) by the total number (votes) of respondents that selected that ranking. For example, 35 respondents rated Cultural Paradigms as a very significant barrier, or it had a negative impact on PBL. This would equate to a negative (-) 140 $[(35 \times (-4))]$. A similar score would then be determined in each of the other Likert scale ratings (significant, moderate, and minimal) for both positive (enablers) and negative (barriers) ratings. These individual scores would then be added together to determine the overall rating score for that factor. The resultant overall rating score for Cultural Paradigms was negative (-) 226, as shown above in the chart.

Cultural Paradigms was the highest-rated barrier (negative ranking scores). The next four negative rated factors (barriers) were lumped together from -118 to -63. These

lumped barrier factors were Technical Data (TD), Funding, Infrastructure/Organization, and Laws/Regulations. The scores of these barriers were so similar that little can be interpreted based on their specific ranking score. The significance is that they were determined to be barriers and significantly less in magnitude from the Cultural Paradigms factor.

The survey determined that from the initial 15 factors, 10 were enablers and five were barriers to PBL implementation. This distribution of factors was considered significant since in the previous study in 2005, seven factors were considered to be enablers while seven others were considered to be barriers. An additional factor on Warfighters' Perspective was included that was not rated in 2005. Specifically, Training and Incentives/Awards had previously (2005) been identified as a barrier. The 2011 study determined they were enablers. Even though these two factors (Training and Incentives) were rated in the lower 30% of the enablers in 2011, it is significant that the respondents did not perceive these two ranked factors to be barriers as they were categorized in the 2005 survey. This highlighted the reason for allowing the respondents to determine by their ratings whether a factor was a barrier or an enabler.

The results highlighted that of the 15 factors rated on the survey (not pre-identified), only five were identified as barriers. Ten were identified as enablers—three more than in the 2005 study. More factors are now (2011) considered to be enablers to PBL implementation than previously identified in 2005. The perceptions in 2011 may be that PBL is not as difficult to implement and more factors are considered to be aids or enablers to its successful implementation.

Figure 12 and Table 2 highlight the overall results of the survey.

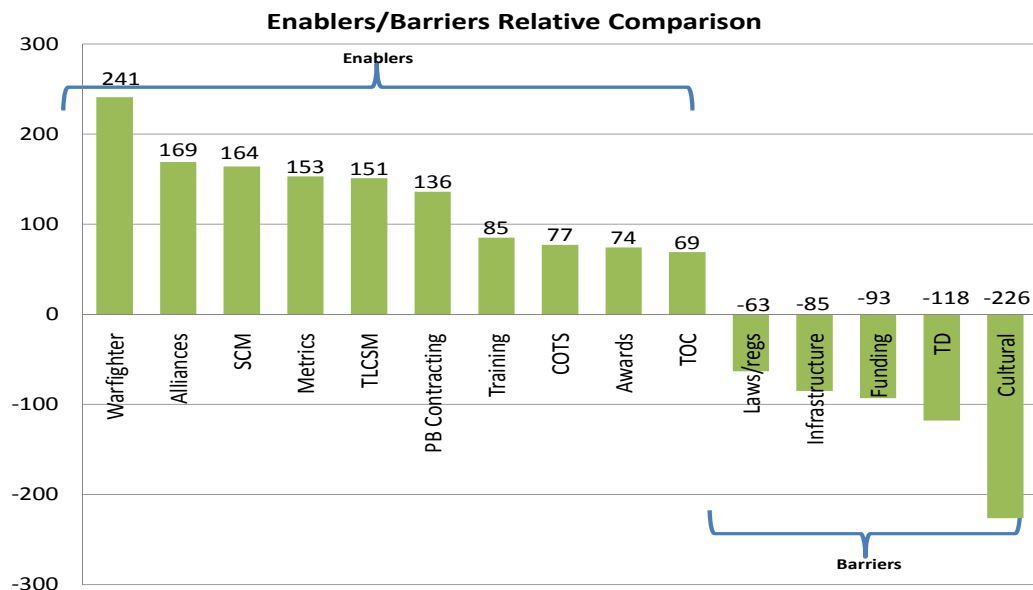


Figure 12. Enablers/Barriers Relative Comparisons

Table 2. Factor Ratings

Q9											
Evaluate following factors to their impact on decisions to consider and/or implement PBL in your program.											
	Barriers (Negative Impact)					Enablers (Positive Impact)					
	Very Significant	Significant	Moderate	Minimal	No Impact	Minimal	Moderate	Significant	Very Significant	N/A	
Funding	30	31	39	14	26	9	19	23	24	6	221
Statutory-regulatory requirements	13	26	34	31	35	17	23	21	10	7	217
Cultural Paradigms	35	45	31	17	31	12	13	18	9	5	216
Existing Infrastructure or Organization	18	36	33	22	27	15	25	22	13	4	215
Technical Data Rights	30	21	28	24	44	13	12	24	9	11	216
PBL Awareness/ Training	13	17	21	19	38	18	31	35	16	6	214
Incentives/ Awards	16	10	13	14	59	23	27	29	11	12	214
Supply Chain Management	10	11	21	17	37	19	21	45	25	7	213
Strategic Alliances/ Partnerships	9	9	20	12	44	22	25	28	32	12	213
Performance Based Contracting	15	11	18	11	42	19	21	37	26	11	211
Performance Metrics	15	8	21	13	32	26	25	44	21	6	211
Total Life Cycle Support Management	13	12	16	8	38	33	29	36	20	6	211
Adoption of COTS	10	10	21	10	59	23	22	24	15	17	211
Total Ownership Cost	11	14	27	21	42	20	20	34	17	7	213
Warfighters' Perspectives	11	11	11	7	40	23	19	42	40	9	213

The results from Question 9 highlighted that at both ends of the spectrum (whether a factor was a barrier or an enabler), there were two significant factors that were obviously identified by the respondents as to what they perceived were the most significant barrier and enabler. The Warfighters' Perspective was rated the highest Enabler, and Cultural Paradigms were rated the highest barrier. Both were over 50 points above the next highest factor in their category (either a barrier or an enabler).

Figure 13 highlights the distribution and scores of the highest enabler (Warfighters' Perspective).

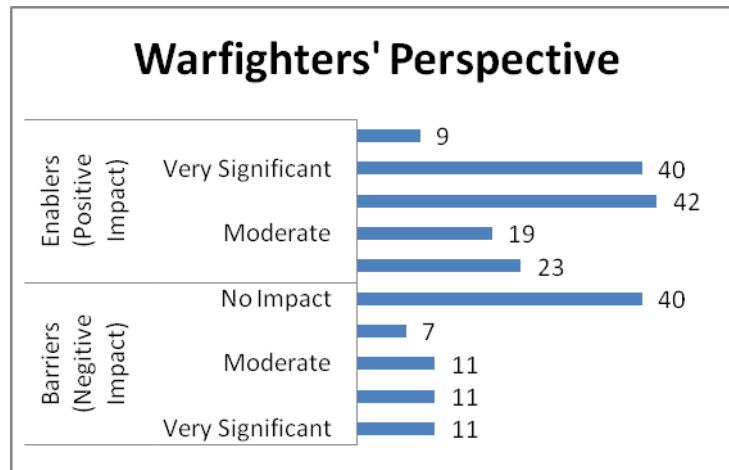


Figure 13. Warfighter's Perspective Distribution and Rating Scores

This distribution chart highlights the significant number and high ratings (very significant 40 [19%] and significant 42 [20%]) for this factor, making it a key Enabler to PBL's successful implementation. Respondents considered this to be the most important factor in enabling or facilitating PBL implementation. This matches the anecdotal information that the warfighter is normally assumed to be one of the most critical elements or factors to a program's overall success. The success of PBL implementation is no different—the Warfighters' Perspective is highlighted as being critical to a program's success. It is significant that there were 40 respondents (19%) that indicated that the Warfighters' Perspective had no impact on their program.

Figure 14 highlights the distribution & rating scores for the highest barrier (Cultural Paradigms).

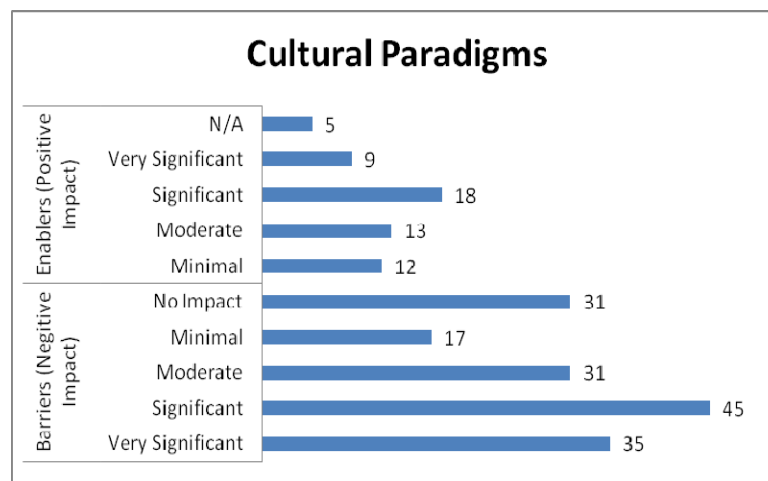


Figure 14. Cultural Paradigms Distribution and Rating Scores

This distribution chart from the survey highlights the significant number and ratings (very significant 35 [16%] and significant 45 [21%]) that made Cultural Paradigms the most important barrier or inhibitor to PBL implementation. Respondents considered this a significant challenge to PBL implementation. Cultural paradigms are normally assumed to

be among the most serious impediments or hindering factors to a program's ability to accept change or accomplish a challenging issue within the program. The success of PBL implementation is no different—cultural paradigms must be overcome if a program or PBL is to succeed in the complex DoD environment. In relationship to PBL implementation, Cultural Paradigms being rated the highest is not surprising given that culture is the most challenging factor to overcome in any significant change, especially when these new concepts or changes are viewed as threats. Many government personnel consider PBL as a threat because of a common misperception that it is a synonym for CLS or contracting out support. This information is vital for any program to consider when attempting to implement a complex challenge—especially PBL, as demonstrated by the feedback in the research surveys from senior program manager and logisticians. It is also significant that there were 31 respondents (14%) that indicated that Cultural Paradigms had no impact on their program. This is considered a high number. There were only five (2%) respondents who answered N/A (not applicable) to Cultural Paradigms, highlighting that the respondents perceived this factor to have significant applicability to their program.

The Warfighters' Perspective had an overall rating score of +241, which was 72 points above the next highest factor, Alliances. It was clear that this factor made a significant impact on PBL implementation from the respondents' perspectives. The respondents believed that if they were able to determine and maintain a Warfighter's point of view, they had a greater ability to effectively implement PBL. Clearly, this is an important message to potential implementers of PBL—if you want to be able to effectively implement PBL, then you need to understand and maintain the Warfighters' Perspective. This is normally a well understood concept, but is one that is not always able to support the tenant with empirical data on how significant it is. This study highlights the importance of the Warfighters' Perspective with empirical data.

The same can be said for Cultural Paradigms—it had a significant impact—but as a barrier. Cultural Paradigms had an overall rating score of -226 which was 108 points above the next highest factor, TD (Technical Data). Like the Warfighters' Perspective, Cultural Paradigms have a significant impact on PBL implementation. This factor is a significant barrier and must be reduced or eliminated if PBL is going to be more successful. Specific paradigms were not detailed in the survey but some commonly known paradigms considered PBL as just contracting out, too expensive, and not flexible enough in terms of providing needed product support. PBL changes how product support can be contracted or partnered, and these changes require hard work to overcome the cultural paradigms or old ways of thinking—doing business as usual. If the DoD is to effectively implement PBL, then the acquisition and sustainment workforce education needs to be continued to reduce cultural paradigms that negatively impact the ability to implement PBL.

Table 3 summarizes the differences between the 2011 survey results and the 2005 survey results (significant differences are highlighted with three asterisks and are in boldface).



Table 3. Comparison of Results for Factor Ratings (2005 vs. 2011)

Factors (*** Significant Changes)	Rating 2005 (14)	Rating 2011 (15)	Differences From 2011	Comments: Significance
Funding***	1 (Barrier)	3 (Barrier)	Lower barrier rating (-2)	Decreased as barrier in 2011; less negative significance ***
Statutory-regulatory requirements	2*(Barrier)	5 (Barrier)	Lower barrier rating (-3)	Decreased as barrier in 2011; minor significance
Cultural Paradigms	2*(Barrier)	1 (Barrier)	Higher barrier rating (+1)	Minor increase as barrier in 2011; same significance
Existing Infrastructure or Organization	5 (Barrier)	4 (Barrier)	Higher barrier rating (+1)	Minor increase as barrier in 2011; same significance
Technical Data (TD) Rights***	6 (Barrier)	2 (Barrier)	Higher barrier rating (+4)	Increased as barrier in 2011; more negative significance***
PBL Awareness/ Training***	2*(Barrier)	7 (Enabler)	Switched to an enabler	Became an enabler in 2011; significant positive change ***
Incentives/Awards ***	7 (Barrier)	9 (Enabler)	Switched to an enabler	Became an enabler in 2011; significant positive change ***
Supply Chain Management (SCM)***	6**(Enabler)	3 (Enabler)	Higher enabler rating (+4)	Increased as enabler in 2011; significant positive change ***
Strategic Alliances /Partnerships***	5 (Enabler)	2 (Enabler)	Higher enabler rating (+3)	Increased as enabler in 2011; significant positive change ***
Performance-based (PB) Contracting	2*(Enabler)	6 (Enabler)	Lower enabler rating (-4)	Decreased as enabler in 2011; minor significance
Performance Metrics***	1 (Enabler)	4 (Enabler)	Lower enabler rating (-3)	Decreased as enabler in 2011; significant negative change ***
Total Life Cycle Support Management (TLCSM)	2*(Enabler)	5 (Enabler)	Lower enabler rating (-3)	Decreased as enabler in 2011; minor significance

Adoption of Commercial off-the-Shelf (COTS)	2*(Enabler)	8 (Enabler)	Lower enabler rating (-6)	Decreased as enabler in 2011; minor significance
Total Ownership Cost (TOC)	6**(Enabler)	10 (Enabler)	Lower enabler rating (-4)	Decreased as enabler in 2011; minor significance
Warfighters' Perspectives***	N/A	1 (Enabler)	Highest 2011 Enabler	Significant as highest enabler in 2011 ***

Note. * Tied rating scores with two other factors for second highest. **Tied rating scores with one other factor for 6th highest enabler. ***Comments below explaining significance.

The following are comments regarding the differences in the factor results from 2011 and 2005 identified in Table 3:

1. **Funding (Lower barrier rating [-2] in 2011. Decreased as barrier in 2011; less negative significance.):** Funding was the most significant barrier in 2005. It was the third highest barrier in 2011. Cultural Paradigms barriers (the highest barrier) and Technical Data were rated as higher barriers than Funding in 2011. Funding had a lower significance in terms of having an impact as a barrier to PBL implementation from 2011 information than 2005. This may indicate that Funding is perceived by PBL implementers as less of a barrier than previously thought in 2005, which is partly due to the more effective use of the Working Capital Fund by all the Services in funding PBL.
2. **Technical Data (TD) Rights (Higher barrier rating [+4] in 2011. Increased as barrier in 2011; more negative significance.):** In 2005 TD was next to last as a barrier. In 2011 it was the second highest barrier to Cultural Paradigms (highest). TD Rights are now considered by survey respondents to be a greater barrier to PBL implementation. Obtaining technical data rights has been experienced as a significant negative impactor or barrier on PBL implementation—one that should be considered by the OSD as a serious factor that needs to be reduced by programs if PBL is to be effectively implemented. Technical Data is now appreciated more as a necessary and vital factor to successful PBL implementation.
3. **Training (Switched to an enabler in 2011. Significant positive change.):** PBL Training was identified and rated as a barrier in 2005. It was rated as second highest to Funding (tied for second with two other barriers). In 2011 Training was considered to be an enabler in the second set of enablers—in the last 40%. This is a significant positive change for this factor. PBL Training is not considered a barrier, and is in fact an effective enabler to implementing PBL. This may indicate that PBL has matured to a point where training can help significantly in PBL's implementation and help with changing many of the faulty perceptions of PBL. Previously, Training was considered a barrier since there was generally a lack of PBL training throughout the Services. When asked in 2011 to evaluate PBL Training without identifying it as a "Lack of Training," PBL Training was considered by survey respondents to be a critical aid to PBL implementation.
4. **Incentives/Awards (Became an enabler in 2011; significant positive change.):** Incentives/Awards were considered and rated as barriers in 2005.



They were rated as the lowest rated factor. In 2011 they were considered to be an enabler in the second set of enablers—in the last 40%. Like Training, this is a significant positive change for the factor of Incentives/Awards. No longer are Incentives/Awards considered a barrier. They are enablers to PBL implementation. Again, PBL has matured to a point where Incentives/Awards are considered as facilitators or enablers to PBL implementation. Previously, Incentives/Awards were considered a barrier since there was ineffective use of these tools or methods in implementation. When asked to evaluate PBL Training in 2011 without identifying it as a “Lack of Depot Incentives,” Incentives/Awards were considered an effective and timely facilitator to PBL implementation.

5. **Supply Chain Management (SCM; Higher enabler rating [+4]. Increased as enabler in 2011; significant positive change.):** In 2005 SCM was considered tied for lowest enabler with RTOC. In 2011 it moved up to the third highest enabler behind Warfighters’ Perspective and Alliances/Partnerships. PBL implementers now realize the greater significance of SCM in helping to implement PBL in a more timely and efficient manner. In general, SCM has played a more significant role in ensuring effective product support throughout the DoD. It is also now more commonly agreed upon by PBL implementers that SCM plays a vital role in leveraging PBL as an effective technique in increasing mission effectiveness and great supportability.
6. **Strategic Partnership/Alliances (Higher enabler rating [+3]. Increased as enabler in 2011; significant positive change.):** In 2005 Partnerships/Alliances were rated 5th highest out of the seven factors evaluated. In 2011 it became the second highest to Warfighters’ Perspectives. Partnerships are appreciated now as significant enablers to PBL implementation. Government and contractors are partnering more often and ensuring the successful deployment of PBL throughout the DoD. Partnerships are a significant enabling tool or institutional method to successful and efficient PBL implementation.
7. **Performance Metrics (Lower enabler rating [-3]. Decreased as enabler in 2011; significant negative change.):** In 2005 Performance Metrics was the highest-rated enabling factor. In 2011 Metrics were rated in the first set of factors as the fourth highest enabler. The relative rating in 2011 was not significant since it was so close in ranking to four other factors in the top 60% of all the factors. Metrics were still considered significant, but not as significant as Warfighters’ Perspective—the highest-rated enabler.
8. **Warfighters’ Perspective (Highest 2011 Enabler. Significant as highest enabler in 2011):** This was a new factor not evaluated in the 2005 study. Warfighters’ Perspective rated significantly higher than any other of the factors in the 2011 study. It is considered the most relevant enabling factor helping to ensure that PBL can be effectively implemented in the DoD.

Recommendations

This research study highlights that PBL has changed, and that the factors considered vital for its implementation have also changed. The following are based on the results of the



study which were extracted from the respondents' information from the deployed 2011 PBL survey:

1. The **Warfighters' Perspectives** are considered the most vital enabling factor to ensure PBL is effectively and efficiently implemented—a significant result of this 2011 study. The Warfighters' Perspectives were rated the highest by senior program managers and logisticians in the study's survey—the most significant enabler to ensure PBL implementation. The respondents indicated that the Warfighter was vital to successful deployment of PBL. In all future endeavors that plan to deploy PBL, the Services, the OSD, and all functional disciplines (PM, contracting, financing, engineering, etc.) should include the Warfighter and their critical perspectives if they desire PBL to be successfully implemented by all involved.
2. **PBL Training and Incentives/Awards** should be considered effective enablers to PBL implementation and need to be fully embraced by the Services and the OSD when implementing PBL. The 2011 survey indicated that current respondents consider these factors to be vital to the success of PBL. They were rated as barriers in 2005, but have been shown in the 2011 study that they are actually effective enablers and need to be leveraged as such. PBL training should be continued through the development of additional courses and Continuous Learning Modules (CLMs) by the DAU and other DoD training agencies. Senior leaders should also attend similar courses and related conferences/symposiums—especially in light of the factor that was considered to be the most significant PBL barrier, Cultural Paradigms. Continual attention should also be placed on ensuring that incentive based contracts are properly managed by the DoD and the Services' contracting agencies.
3. **Cultural Paradigms** should be addressed very carefully by all PBL implementers. This factor was identified by respondents as the major barrier to successful PBL deployment. DoD leadership must address this fact and ensure that PBL training is provided, so that all involved more clearly understand what is at stake (more affordable product support, increased readiness, enhanced efficiencies, etc.). Additionally, they should understand the cultural impediments to PBL's acceptance as an effective means to ensure greater product support and mission effectiveness. Success stories that highlight the true capabilities of PBL should be developed and shared throughout the Services—along with how and who have been most successful in implementing PBL. Specific attention should be placed on removing cultural impediments. In particular, future training should include awareness of related cultural impediments and techniques for reducing these impediments. The target audience for this type of training would be senior program managers and logisticians.
4. Emphasis should be placed on enhancing all the identified 10 enablers. Conversely, efforts should be placed on reducing the effects of the five identified barriers. Besides the Warfighters' Paradigm, the five factors in the first grouped set (Partnerships, SCM, Metrics, TLCSM, and PB Contracting) will provide the greatest payback in terms of obtaining the largest benefit for the critical and limited time and/or resources invested. Besides focusing on Cultural Paradigms, the four grouped items identified as barriers (TD, Funding, Infrastructure, and Laws/Regulations) should be treated as



opportunities for mitigation efforts to reduce their negative impacts on effective PBL implementation.

Overall Recommendation

The 2011 survey identified 10 critical PBL enablers that should be enhanced; it also identified five barriers that should be minimized in PBL implementation.

Summary

The results of this study were obtained via a survey deployed to the DoD and contractor personnel working primarily in program management and logistics management by the Defense Acquisition University. The study highlighted the impact of 15 factors on the implementation of Performance-based Life Cycle Product Support (PBL). Significant information was obtained on these 15 factors regarding their effects on PBL implementation. Ten of the evaluated factors were determined to be enablers to implementation, while five were determined to be barriers. The 10 identified enablers should be enhanced, and the five identified barriers should be reduced, in terms of their impact on PBL implementation. The study also contrasted the 2011 results to a previous 2005 study on PBL barriers and enablers.

The research provided the following results:

1. The top two most significant enabling factors for PBL were maintaining Warfighters' Perspective and Strategic Alliances/Partnering in the 2011 study;
2. The top two barriers to PBL were Cultural Paradigms and Technical Data in the 2011 study;
3. Warfighters' Perspective (2011) replaced Performance Metrics from the 2005 study as the most significant enabler;
4. Cultural Paradigms (2011) replaced Funding from the 2005 study as the most significant barrier; and
5. Two barriers from the 2005 study were determined to be enablers in the 2011 study (Training and Awards/Incentives).

Conditions and perceptions have changed with PBL in six years. Specifically, the Warfighters' Perspective is the most significant enabling factor. Cultural Paradigms are the most significant barrier factor. Training and Incentives/Awards have now become enablers in 2011; they were barriers in 2005.

The results of this study have applications to successful implementation of PBL throughout the DoD and in the commercial industrial workplace. With limited resources available throughout the DoD, this study can be an indicator of those factors considered vital to the successful continued deployment of PBL by the Services and can be a barometer to DoD leadership on where and what needs additional changing with PBL.

References

Beggs, J., Seymour, T., & Ertel, B. (2005). *Performance-based logistics perspective*. Retrieved from <http://www.boozallen.com/media/file/performance-based-logistics-perspective.pdf>



- Canaday, H. (2010, September). *How much will sustainment change?* Military Logistics Forum. Retrieved from <http://www.military-logistics-forum.com/military-logistics-forum/272-mlf-2010-volume-4-issue-8-september/3351-how-much-will-sustainment-change.html>
- DoD. (2009). *Department of Defense reliability, availability, maintainability, cost rationale report manual*. Retrieved from <https://acc.dau.mil/adl/en-US/378147/file/51172/RAM-C%20Manual%20Jun%2009.pdf>
- DeVries, H. (2005, March). Performance-based logistics—Barriers and enablers to effective implementation. *Defense Acquisition Review Journal*, 11(3), 243–253.
- Fowler, R. (2009, January–February). Misunderstood superheroes. *Defense AT&L Magazine*. Retrieved from <http://www.dau.mil/pubscats/PubsCats/atl/jan-feb09.pdf>
- Fowler, R. (2010, March–April). The future of product support. *Defense AT&L Magazine*. Retrieved from http://www.dau.mil/pubscats/ATL%20Docs/Mar-Apr10/fowler_mar-apr10.pdf
- Geary, S., Koster, S., Randall, W. S., & Haynie, J. J. (2010, October). Performance-based life cycle product support (PBL) strategies: Enablers for more effective government participation. *Defense Acquisition Review Journal*. Retrieved from <http://www.dau.mil/pubscats/Pages/ARJ.asp>
- Kobren, B. (2009, October). What performance based logistics is and what it is not—and what it can and cannot do. *Defense Acquisition Review Journal*. Retrieved from <http://www.dau.mil/pubscats/PubsCats/Kobren.pdf>
- Miller, A. (2008, November 3). Performance-based logistics works. *Aviation Week & Space Technology*. Retrieved from http://www.ndbi.utk.edu/Uploads/files/Miller_Aviation_Week_11-08.pdf
- Oming, T. (2010, January–March). Unmanned aircraft systems (UAS) project office (PO) finds powerful cost efficiency advantages through proper performance-based logistics (PBL). *Army AL&T*, 14–19.
- USD(AT&L). (2007). *The defense acquisition system* (DoD Directive 5000.01). Retrieved from <http://www.dtic.mil/whs/directives/corres/pdf/500001p.pdf>



Background

Introduction

Literature
Review

Methodology

Tools

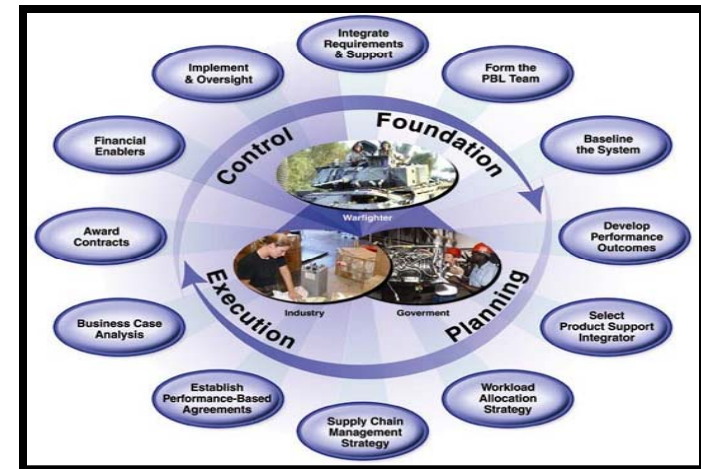
Data/Results

Findings/
Recom'dations

Conclusions



PERFORMANCE BASED LIFE CYCLE PRODUCT SUPPORT: *A NEW LOOK AT ENABLERS & BARRIERS*



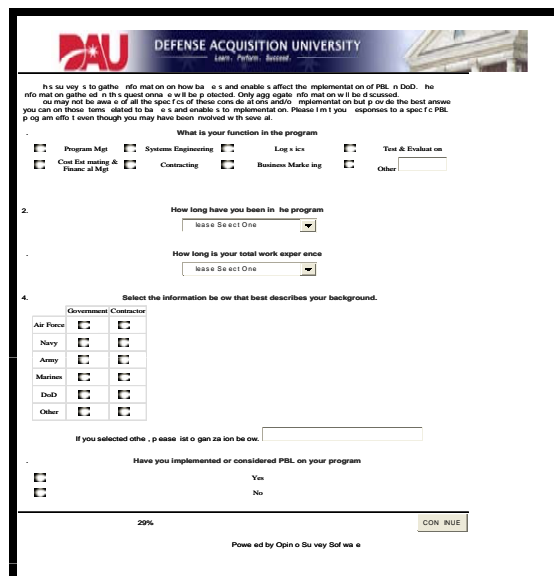
CONDUCTED BY
DEFENSE ACQUISITION UNIVERSITY
PROFESSOR DR. TOM R. EDISON (BRIEFER)
PROFESSOR DR ANDRE MURPHY

Basis of Analysis

Data Gathering Meth



*Historical
Review/Literature
Review*



DEFENSE ACQUISITION UNIVERSITY
Learn · Perform · Succeed

It is necessary to gather information on how business and unstable affect the implementation of PBL in DoD. The information gathered in this questionnaire will be processed. Only aggregate information will be discussed. You may not be aware of all the specifics of these concepts at once and/or implementation on but provide the best answer you can on those items related to business and unstable to implement on. Please enter your responses to a specific PBL program even though you may have been involved with several.

What is your function in the program?

☐ Program Mgt ☐ Systems Engineering ☐ Logistics ☐ Test & Evaluation
☐ Cost Estimating & Planning ☐ Contracting ☐ Business Marketing ☐ Other

2. How long have you been in the program?
 (base Select One)

How long is your total work experience?
 (base Select One)

4. Select the information below that best describes your background.

Government/Contractor	
Air Force	<input type="checkbox"/>
Navy	<input type="checkbox"/>
Army	<input type="checkbox"/>
Marines	<input type="checkbox"/>
DoD	<input type="checkbox"/>
Other	<input type="checkbox"/>

If you selected other, please list organization below:

Have you implemented or considered PBL on your program?

☐ Yes ☐ No

20%

Please add by Opinion Survey Software

Survey



Personal Interviews

Tools



Subject Matter Experts



OPINIO (Survey Tool)



Data Analysis Applications



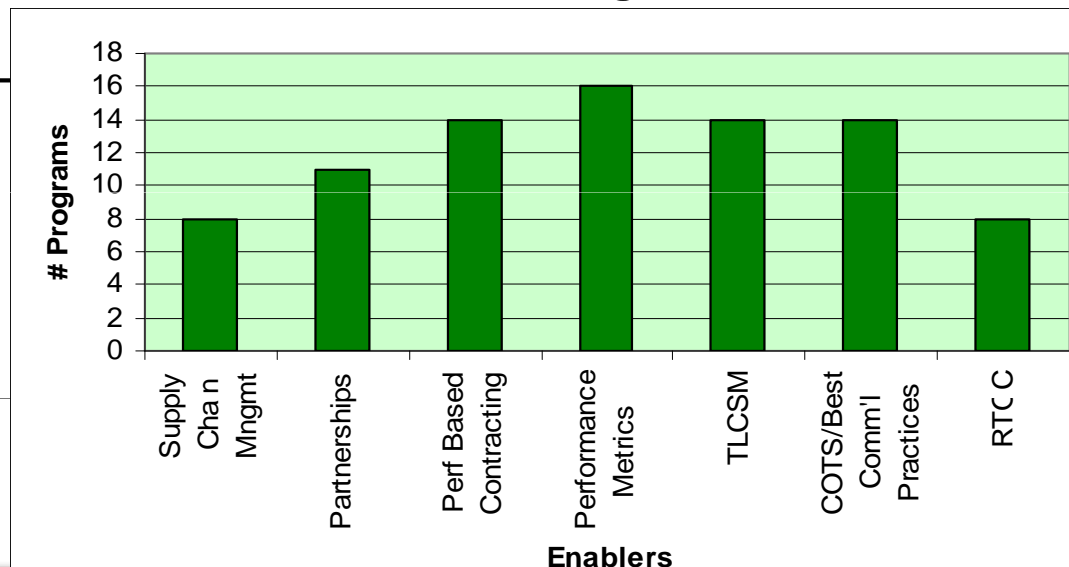
Presentation Specialists

Enablers to PBL Implementation

Dr Hank Devries (n=27; 2005)

Results of the 7 pre-identified ENABLERS:

1. Most frequent enabler to success was Performance Metrics. Performance-based Contracting, Total Life Cycle System Management (TLCSM), and COTS/Best Commercial Practices next highest (same ratings/rankings).
2. Fewer programs were affected by Supply Chain Management (SCM) and RTOC (Reduction in Total Operating Costs).
3. Note: Not mentioned was Partnership. Rated above both SCM and RTOC in the study; below Performance-Base Contracting, TLCSM, and COTS Practices.

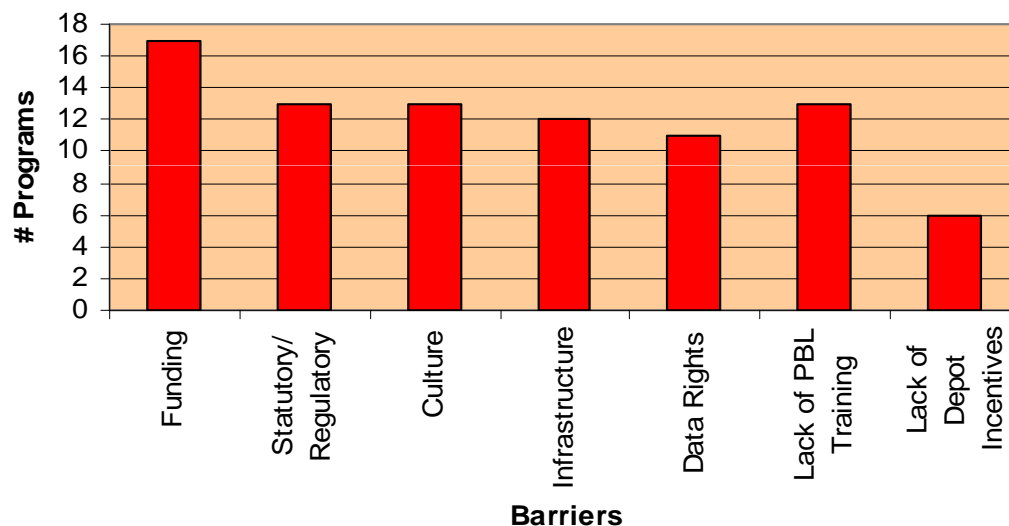


Barriers to PBL Implementation

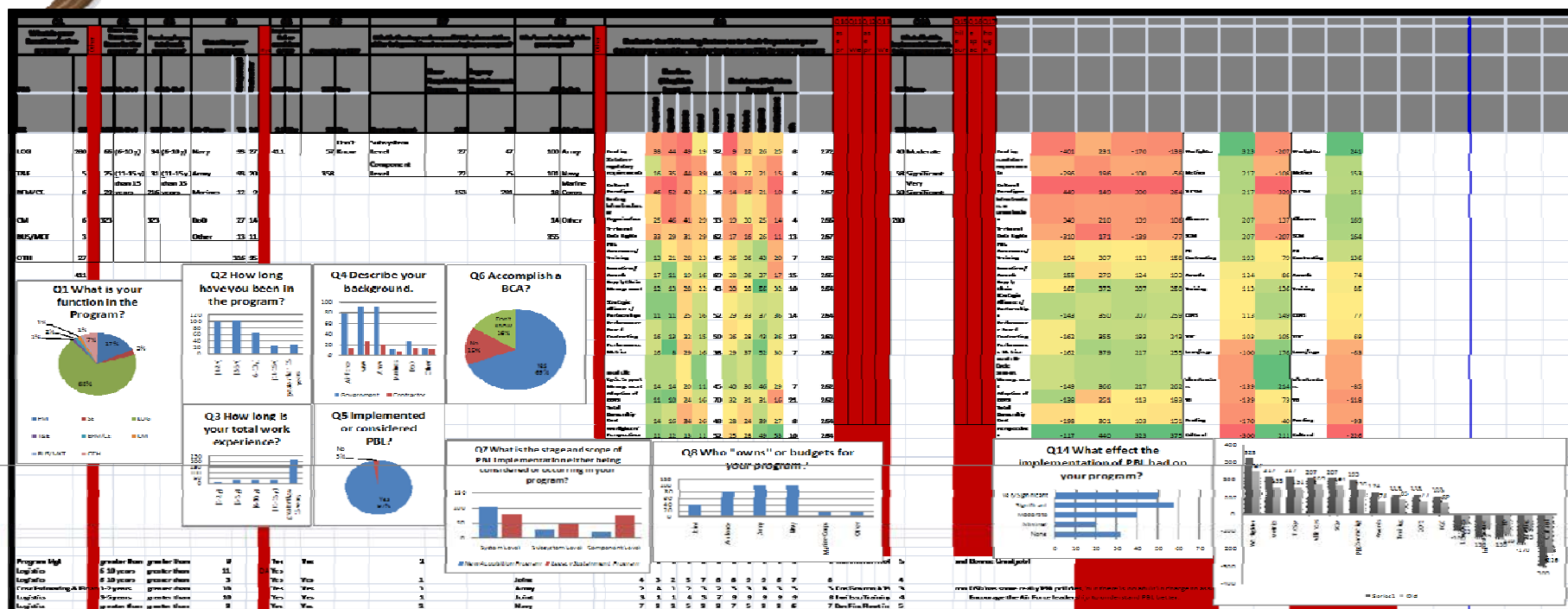
Dr Hank DeVries (n=27; 2005)

Results of the 7 pre-identified BARRIERS:

1. Funding most frequently encountered barrier followed by Statutory/Regulatory, Culture, and Lack of PBL Training.
2. Least encountered barrier was Lack of Organic Depot Incentives, due to the use of commercial depots by some of the programs surveyed. (DeVries, 2005)
3. Note: Not mentioned : Infrastructure and Data Rights. These two rated more serious than Lack of Depot Incentives but lower than the higher rated barriers of Statutory/Regulatory, Culture, and Lack of PBL Training.



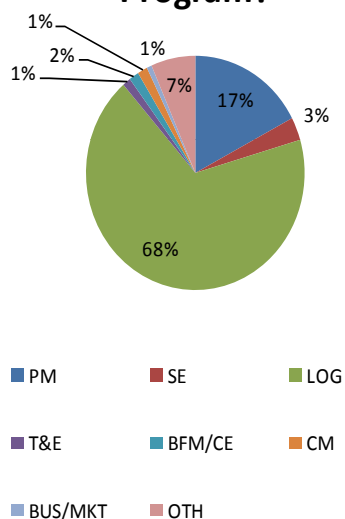
Survey data



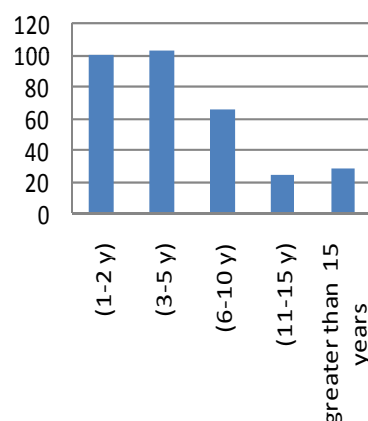
**Survey
Data**

Demographics: n=293

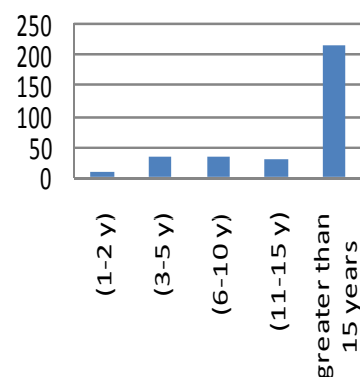
Q1 What is your function in the Program?



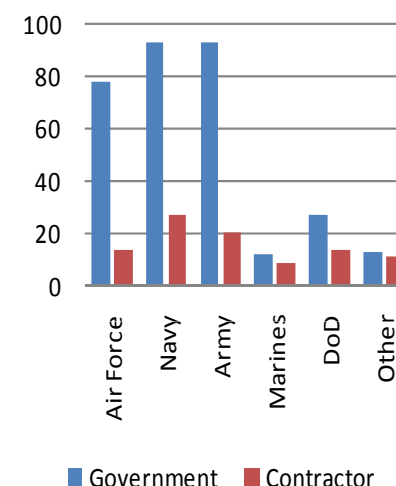
Q2 How long have you been in the program?



Q3 How long is your total work experience?



Q4 Describe your background.



Logistics—highest functional area.

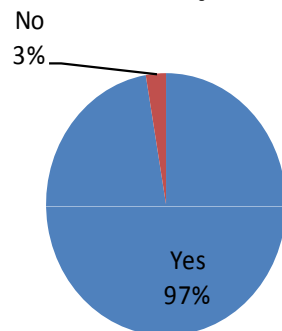
1-5 years with their current program.

Work experience greater than 15 years.

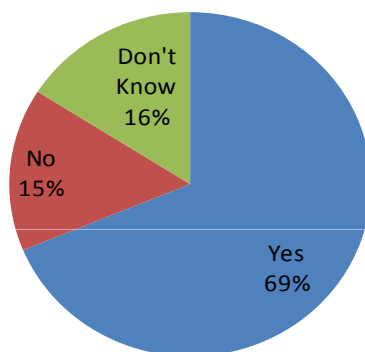
Equal mix of Air Force, Navy, and Army; mostly from government.

Question #5, 6, 7

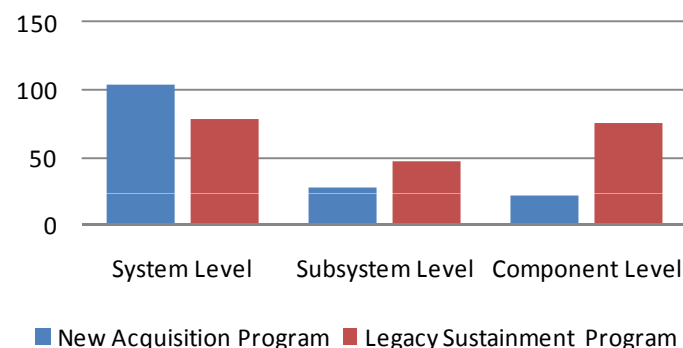
Q5 Implemented or considered PBL?



Q6 Accomplish a BCA?



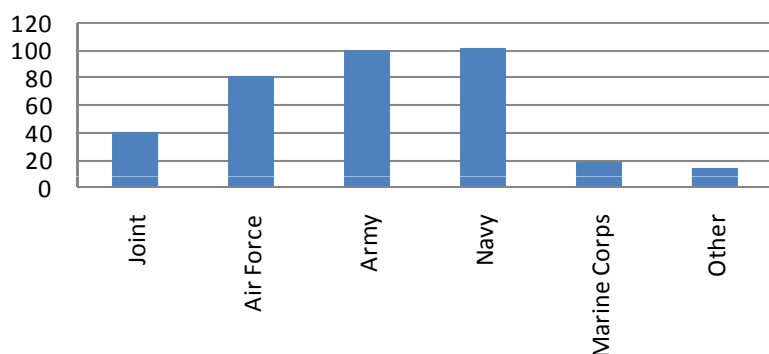
Q7 What is the stage and scope of PBL implementation either being considered or occurring in your program?



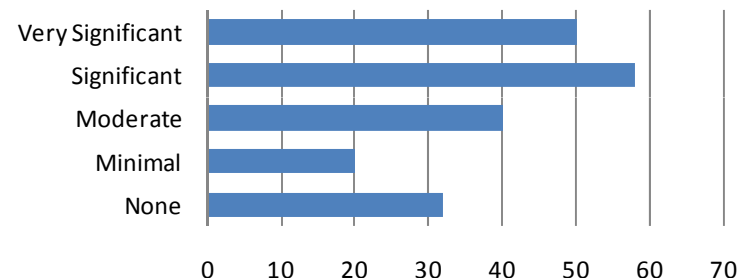
**Significant number (97%) had implemented PBL.
BCA accomplished 69%; no were 15%; 16% did not know.
Stage & scope: New system level 100; Total 150 new acq; Total 200 legacy.**

Question #8, 14

Q8 Who "owns" or budgets for your program?



Q14 What effect the implementation of PBL had on your program?

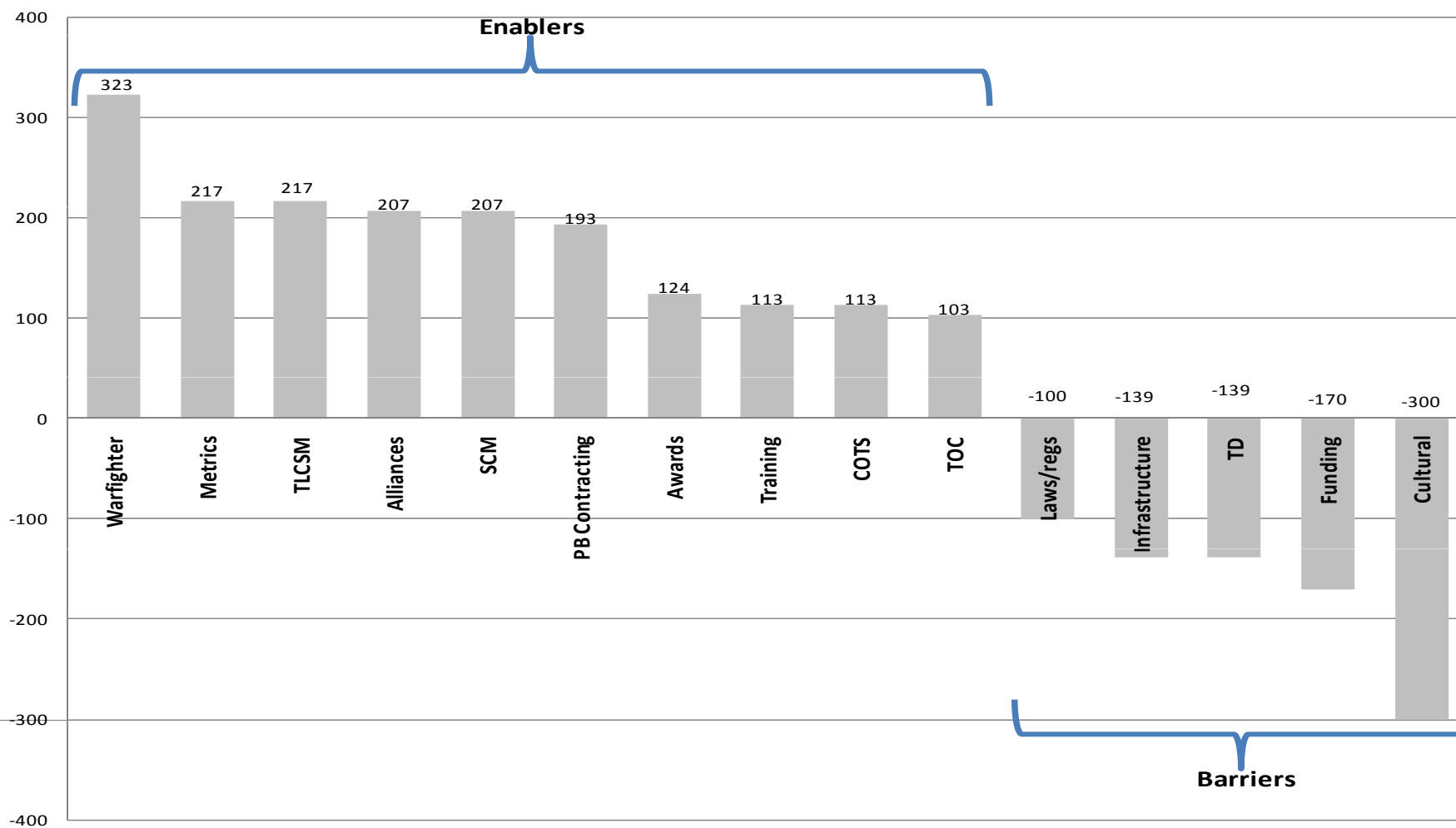


Ownership equal between three major services.

105 thought either very significant or significant impact on program.

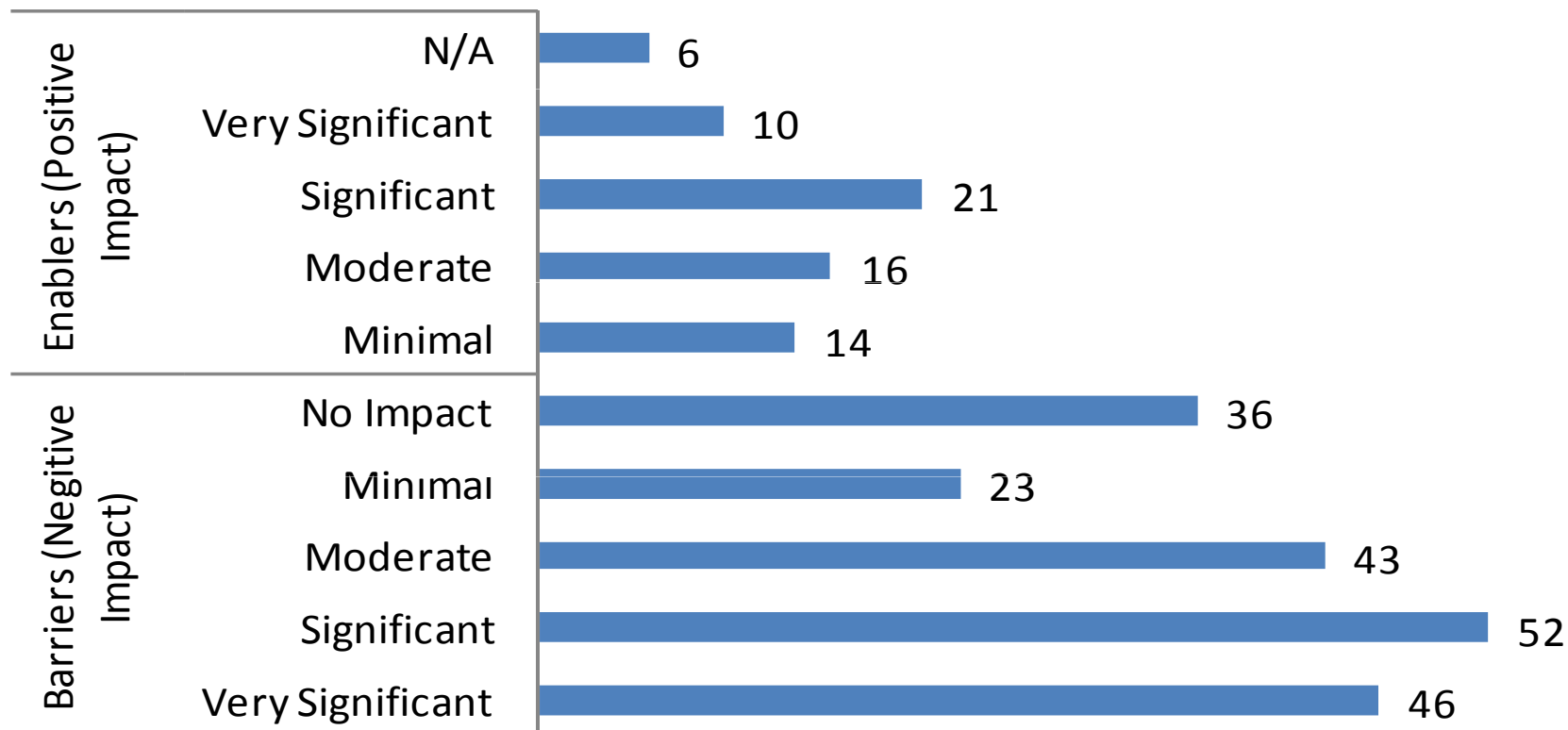
Question #9 (n=293; 27 April 2011)

Enablers/Barriers Relative Comparison



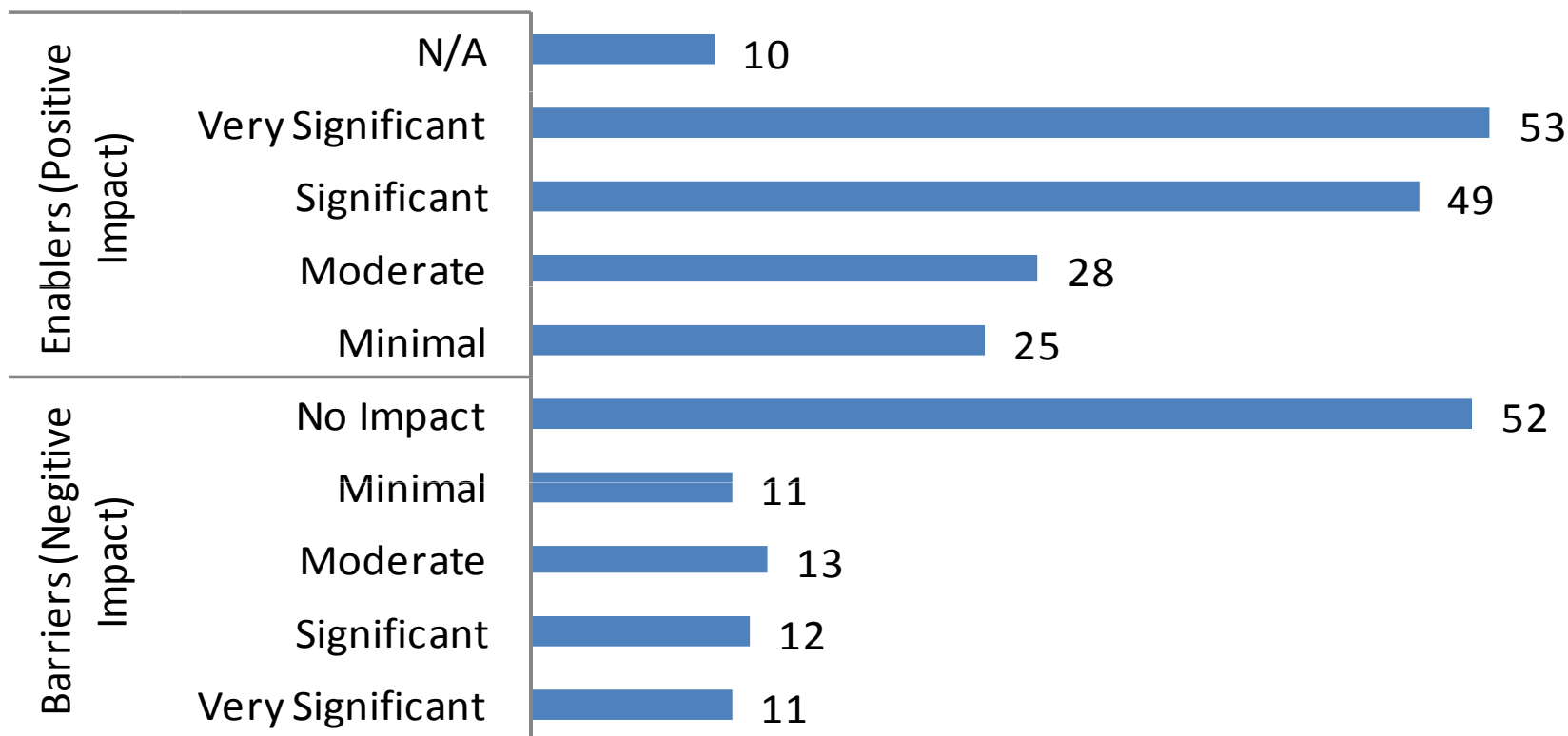
Question #9 (n=293; 27 April 2011)

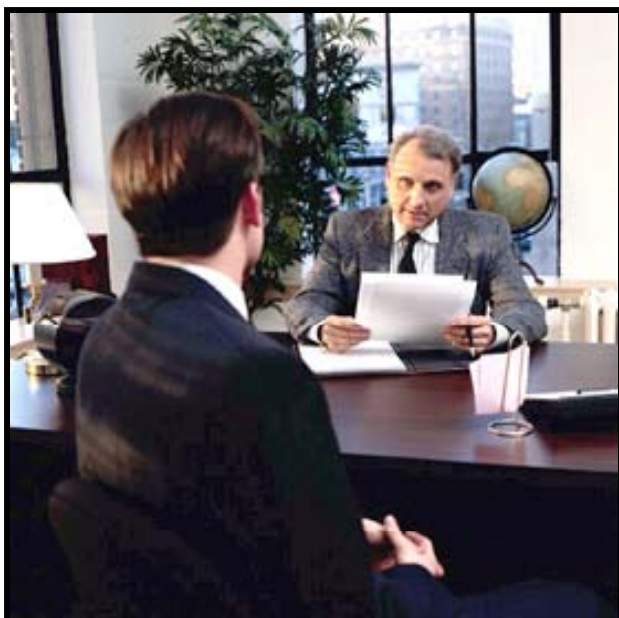
Cultural Paradigms



Question #9 (n=293; 27 April 2011)

Wartighters' Perspective





Personal Interviews:

- Future plans are to conduct interview of SME's on PBL Implementation to confirm the data collected in this electronic survey.
- Obtained numerous comments on survey that have not been officially reviewed.
- Based on respondents approval to be contacted by researcher in future will contact them based on their comments (relevancy to study).



Aggregate Data

<u>Factors</u> (*Significant Changes)	<u>Rating</u> <u>2005 (14)</u>	<u>Rating</u> <u>2011 (15)</u>	<u>Difference</u> <u>From 2011</u>	<u>Comments: Significance</u>
Funding*	1 (Barrier)	2 (Barrier)	Lower barrier rating (-1)	Decreased as barrier in 2011; less negative significance.
Statutory-regulatory requirements	2 (Barrier)	5 (Barrier)	Lower barrier rating (-3)	Decreased as barrier in 2011; minor significance.
Cultural Paradigms	2 (Barrier)	1 (Barrier)	Higher barrier rating (+1)	Minor increase as barrier in 2011; minor significance.
Existing Infrastructure or Organization	5 (Barrier)	3 (Barrier)	Higher barrier rating (+2)	Minor increase as barrier in 2011; minor significance.
Technical Data (TD) Rights*	6 (Barrier)	3 (Barrier)	Higher barrier rating (+3)	Increased as barrier in 2011; more negative significance
PBL Awareness/Training*	2 (Barrier)	8 (Enabler)	Switched to an enabler	Became an enabler in 2011; significant positive change.
Incentives/Awards*	7 (Barrier)	7 (Enabler)	Switched to an enabler	Became an enabler in 2011; significant positive change.
Supply Chain Management(SCM)	6 (Enabler)	4 (Enabler)	Higher enabler rating (+2)	Increased as enabler in 2011; minor significance.
Strategic Alliances /Partnerships	5 (Enabler)	4 (Enabler)	Higher enabler rating (+1)	Increased as enabler in 2011; minor significance.
Performance Based (PB) Contracting	2 (Enabler)	6 (Enabler)	Lower enabler rating (-4)	Decreased as enabler in 2011; minor significance.
Performance Metrics	1 (Enabler)	2 (Enabler)	Lower enabler rating (-1)	Decreased as enabler in 2011; minor significance.
Total Life Cycle Support Management (TLCSM)	2 (Enabler)	2 (Enabler)	Same enabler rating	Same enabler rating in 2011; same significance.
Adoption of Commercial off the Shelf (COTS)	2 (Enabler)	8 (Enabler)	Lower enabler rating (-6)	Decreased as enabler in 2011; minor significance.
Total Ownership Cost (TOC)	6 (Enabler)	10 (Enabler)	Lower enabler rating (-4)	Decreased as enabler in 2011; minor significance.
Warfighters' Perspectives*	N/A	1 (Enabler)	Highest 2011 Enabler	Significant as highest enabler in 2011.

1. Funding (Lower barrier rating (-1) in 2011. Decreased as barrier in 2011; less negative significance.):

- 2005 Funding most significant barrier.
- 2011 second highest barrier.
- Indicates Funding perceived by PBL implementers as less of a barrier than previously thought in 2005.
- Due to the more effective use of the Working Capital Fund by all the services in funding PBL and other funding initiatives.

2. Training (Switched to an enabler in 2011. Significant positive change.):

- 2005 PBL Training was a barrier; rated as second highest to Funding.
- 2011 Training was considered to be an enabler in the second set of enablers—in the last 40%.
- Significant positive change for this factor.
- PBL Training is not a barrier and is an effective enabler to implementing PBL.
- Indicates that PBL has matured to a point where training can help significantly in PBL's implementation.

3. Incentives/Awards (Became an enabler in 2011; significant positive change.):

- 2005 Incentives/Awards were rated as barriers; were rated as the lowest rated barrier.
- 2011 rated an enabler in last 40% grouping of enablers.
- Significant positive change for Incentives/Awards.
- PBL has matured to a point where Incentives/Awards are considered as facilitators or enablers to PBL implementation.

4. Warfighters' Perspective (Highest 2011 Enabler. Significant as highest enabler in 2011):

- A new factor not evaluated in the 2005 study.
- Warfighters' Perspective rated significantly higher than any other of the factors in the 2011 study.
- Considered the most relevant enabling factor helping to ensure that PBL can be effectively implemented.
- Needs to be acknowledged as key to successful PBL implementation

1. **Warfighters' Perspectives** most important enabling factor to ensure PBL is effectively and efficiently implemented--a significant result of this 2011 study.
 - a) Senior program manager and logisticians indicated that the Warfighter was vital to successful development of PBL.
 - b) In all future endeavors that plan to deploy PBL, the Services , OSD, and all functional disciplines (PM, contracting, financing, engineering, etc) should include the Warfighter and their critical perspectives if they desire PBL to be successfully implemented.

- 2. PBL Training and Incentives/Awards** are effective enablers to PBL implementation and need to be fully embraced by the Services and OSD when implementing PBL.
- a. Data indicated that current respondents consider these factors to be vital to success of PBL.
 - b. Rated as barriers in 2005; have been shown in 2011 study are actually effective enablers and need to be leveraged as such.
 - c. PBL training should be continued and potential implementers should attend PBL/DAU courses and related conferences/symposiums.
 - d. Would also aid in reducing impact of PBL barrier, Cultural Paradigms.
 - e. Continual attention should also be placed on ensuring that incentive based contracts are properly managed by DoD and the services contracting agencies.

- 3. Cultural Paradigms** were identified by respondents as the major barrier to successful PBL deployment.
- a. DoD leadership should ensure that PBL training provided so personnel understand what is at stake (more affordable product support, increased readiness, enhanced efficiencies, etc).
 - b. Should understand what the cultural impediments are to PBL's acceptance as an effective means to ensure greater product support and mission effectiveness.
 - c. Success stories that highlight the true capabilities of PBL should be developed and shared throughout the services—along with how and who have been most successful in implementing PBL.
 - d. Future training should include awareness of related cultural impediments and techniques for reducing PBL impediments.
 - e. Target audience for this type of training would be senior program managers and logisticians.

- 4. OVERALL RECOMMENDATION:** Emphasis should be placed on enhancing all the identified 10 enablers. Efforts should be placed on reducing the effects of the 5 identified barriers.
- a. Besides Warfighters' Perspectives five enabling factors in the first grouped set (Partnerships, SCM, Metrics, TLCSM, and PB Contracting) will provide greatest payback in terms of obtaining largest benefit for critical and limited time and/or resources invested.
 - b. Besides focusing on Cultural Paradigms, 4 grouped items identified as barriers (TD, Funding, Infrastructure, and Laws/Regulations) should be treated as opportunities for mitigation efforts to reduce negative impacts on effective PBL implementation.
- .

SUMMARY

- Wartighters' Perspective (2011) replaced Performance Metrics from 2005 study as most significant enabler;
- Cultural Paradigms (2011) replaced Funding from 2005 study as most significant barrier; and
- Two barriers from 2005 study determined to be enablers in 2011 study (Training & Awards/Incentives).

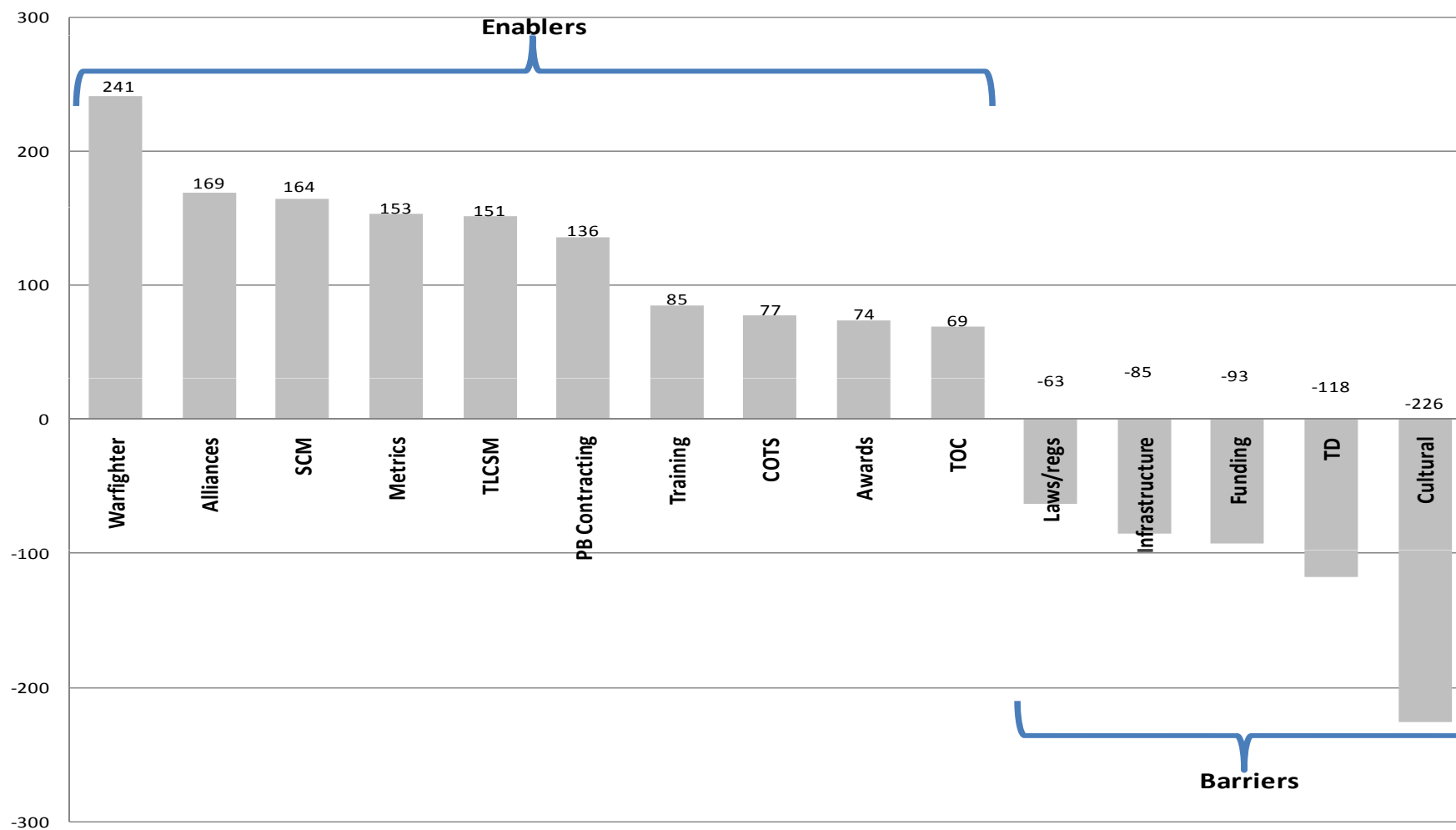
FINAL RECOMMENDATIONS

- **Results of this survey should be used to highlight current barriers and enablers.**
- **Will be used in DAU training to inform attendees of these elements of PBL implementation—new LOG 340 (DAU) course**
- **Continuing to review comments and suggestions in the survey to make recommendations and proposals for additional changes.**
- **More empirical studies need to be accomplished to obtain meaningful data on PBL ROI and lessons learned.**

Questions?

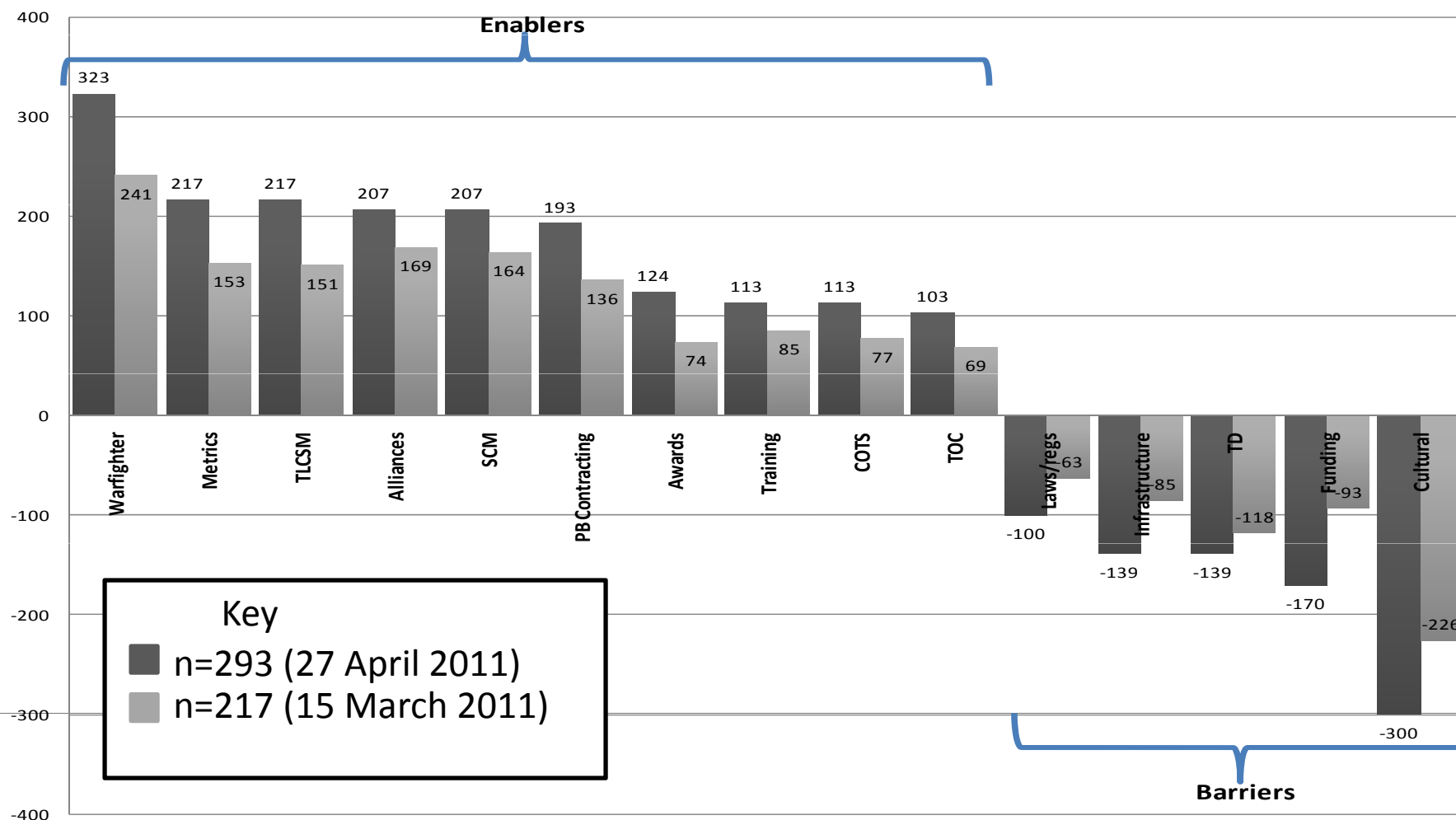
Question #9 (n=217; 15 March 2011)

Enablers/Barriers Relative Comparison



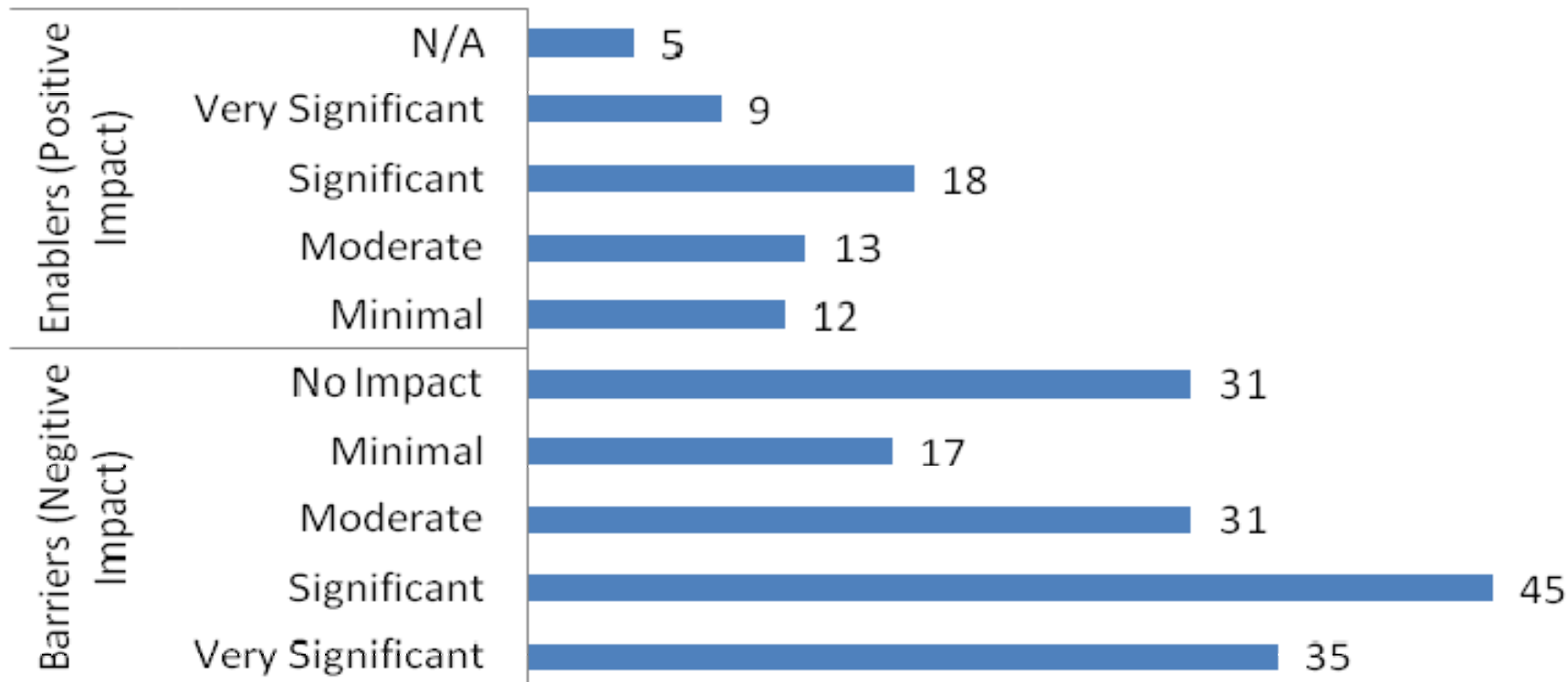
Question #9 Comparison—Two sets of data

Enablers/Barriers Relative Comparison



Question #9 (n=217; 15 March 2011)

Cultural Paradigms



Question #9 (n=217; 15 March 2011)

Warfighters' Perspective

